

**AN OVERVIEW OF SUBSISTENCE HARVEST AREA INFORMATION
FOR ALASKA NATIVE COMMUNITIES
IN THE AREA AFFECTED BY THE EXXON VALDEZ OIL SPILL**

by

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INTRODUCTION

Following the *Exxon Valdez* oil spill of March 24, 1989, the Division of Subsistence of the Alaska Department of Fish and Game has conducted systematic household interviews in communities which use the area affected by the spill for subsistence activities. Interviews were conducted in 15 Alaska Native communities in the spill area pertaining to 1989, 7 communities for 1990, 8 communities for 1991, 6 for 1992, and 7 for 1993. Study communities and sample sizes are summarized in Table 1. Research for 1990 was supported in part through a cooperative agreement with the U.S. Department of the Interior, Fish and Wildlife Service. The research for 1991, 1992, and 1993 was funded through a cooperative agreement with the U.S. Minerals Management Service (MMS).

The purpose of the household interviews has been to collect systematic data on patterns of subsistence uses in the years after the oil spill to compare with pre-spill patterns. One set of questions has focused on uses of particular areas for harvest activities. The goal of these questions was to determine if changes had occurred in uses of these areas for subsistence activities after the oil spill. This report provides an overview of the results of these use area questions. It was prepared as part of a cooperative agreement between the Division of Subsistence and the U.S. Department of the Interior, Minerals Management Service (No. 14-35-001-30539). For a discussion of other findings of these studies, the reader should consult the final report prepared for the second MMS cooperative agreement (Fall and Utermohle, forthcoming).

METHODS

Prior to the oil spill, the Division of Subsistence had conducted mapping research in each of the 15 study communities. Maps were prepared which showed the extent of the areas used by each community for various subsistence activities. The time period was either the lifetime of community's residents or approximately the two decades prior to the interviews, generally from the mid 1960s to the mid 1980s. These maps appear in several atlases and division technical papers and are also on file in the division's Anchorage office (Stanek 1985, Stratton and Chisum 1986, Stratton 1990, ADF&G 1985, Morris 1987, Fall et al., forthcoming).

For the 1989 study year, researchers consulted with key respondents in each community or area, using the previously prepared maps to define subareas within the community's range for further inquiry. The areas that were defined for each community or set of communities are listed in Table 2 through Table 10 and depicted in Figures 1 to 10. These areas were then depicted on a map. Respondents were able to add areas that were outside the bounds of the maps. Referencing this map, respondents were asked a series of questions for each area for the following resource categories:

- Salmon (noncommercial only)**
- Finfish other than salmon (noncommercial only)**
- Shellfish (noncommercial only)**
- Deer (Prince William Sound and Kodiak only)**
- Marine mammals**
- Waterfowl**

For each resource category, the following questions were asked for each area. These questions were asked directly following the collection of harvest and use information for the category.

- 1. Did your household use this area to harvest [resource category] in 1989?**
- 2. Did your household use this area to harvest [resource category] in 1988?**
- 3. Do you use this area regularly to harvest [resource category]? [An area was defined as used regularly if it had been used more than twice in the last 10 years.]**

It should be noted that for the 1989 study year, as well as in subsequent years, the use area questions were part of a detailed survey instrument that also collected information on harvests and uses of all subsistence resources, employment data, demographic information, and several other topics. On average, these interviews took 0.9 hours (54 minutes) to complete, although interviews with very active harvesters took considerably longer. With so many use areas listed, and so many other topics needing to be covered in these comprehensive surveys, it was usually not possible to explore issues regarding use areas in depth with respondents.

A different method was used for the 1990 study year, when seven communities were surveyed. These were Chenega Bay, Tatitlek, Nanwalek, Port Graham, Karluk, Larsen Bay, and Ouzinkie. For each study community, researchers chose three harvest areas for investigation. These are listed in Table 11. (Note that the areas for Nanwalek and Port Graham were the same because of the overlapping use areas of these two communities.) Respondents were able to add a fourth area if they so desired. The reason for limiting interviewing to a few areas was to allow time for respondents to explain their uses of these areas in more depth than had been possible (because of time constraints) in the 1989 study year. For each area, the following questions were asked:

- 1. Did you harvest resources in this area before the spill?**
- 2. If so, which resources? (salmon, other finfish, big game, small game, marine mammals, invertebrates, birds, plants, other)**
- 3. How frequently do you use the area? (open-ended response)**
- 4. Have you harvested resources in this area since the spill?**

5. If so, which resources? (salmon, other finfish, big game, small game, marine mammals, invertebrates, birds, plants, other)
6. Has your use of the area returned to pre-spill levels?
7. If not, why?

All the use area questions were administered in a single section of the questionnaire. Upon review, it was decided not to code the questions regarding frequency of use for further analysis because of ambiguities regarding the responses and a great deal of missing data.

It should be noted that while in the first study year, respondents were asked whether they had used an area "regularly" before the spill (as well as in 1988, the year before the spill), in subsequent years, they were asked only if they had used the area at all. In some communities, this may account for differences between the pre-spill estimates in use levels for the areas which were retained on the 1990 and subsequent questionnaires. Although "regularly" was defined as "more than twice over the last ten years" it is uncertain if respondents were systematically informed of this definition. This limitation may have discouraged respondents who frequently, but not annually, used areas, from reporting their use of an area as "regular" before the spill. Levels of involvement in using particular areas documented for the 1990 and subsequent study years may therefore be a better representation of the portion of each community's households which consider particular places as part of their traditional harvest area.

Data gathering methods used for 1991 were identical to those used for 1990. However, harvest area questions were only retained for the Prince William Sound communities of Chenega Bay and Tatitlek. For the 1992 study year, use area and other data were only collected for Chenega Bay. For the following year (1993), use area questions were again asked in both Chenega Bay and Tatitlek.

DATA ANALYSIS

The study did not collect data on the intensity of use of areas by particular households, such as the number of times that a person engaged in a subsistence activity in a specific area. Also, no data were collected on the productivity of particular areas, such as the numbers of animals harvested there in the study year. This was primarily because such data were not available for the pre-spill period and because of amount of time required to conduct the interviews. Thus, the data presented in the tables and figures in this report which depict a general increase in use of areas over time may overstate the extent of any return to pre-spill patterns. In order to address these limitations, after the 1989 study year, households were asked whether their use of an area had returned to pre-spill norms and, if not, why this had not occurred. These responses are included in case household descriptions in this report.

It was not possible to interview the same set of respondents in every study year, for several reasons. First, some were not available for interviewing, while others declined to participate in the research in particular study years. Also, some respondents moved away from the study communities in

subsequent years, while new families moved in. A few respondents passed away. In order to control for the changing composition of the interview sample, a sub-sample of households was identified in Chenega Bay and Tatitlek who had been interviewed for 1989 and had resided in the villages before the spill. These sub-samples' uses of three geographic areas were then tracked through the succeeding four study years. The results are depicted in Figures 11 through 64. In order to control for the limitation placed on respondents' pre-spill use of areas in the 1989 study year as "regular" use, each household in the subsample was recorded as using an area before the spill if they had indicated such pre-spill use when interviewed in any study year. Also, each household was recorded as having post-spill use of an area if they had indicated a use in any of the post-spill study years. Thus, post-spill use was cumulative for each household. Since the question posed each year was "Have you used this area since the spill?" it was not possible to control for households which had returned to an area for subsistence activities and then, again, abandoned their use of that area. This limitation further underscores the importance of the case household descriptions.

Although interviews were not done in Tatitlek for 1992, it was possible to depict the minimum percentage of the sub-sample which had used an area since the spill based on the previous years' responses. If a household had not used an area in 1989, 1990, or 1991, but had used it in 1993, their use in 1992 was classified as unknown. If their response was "no" in 1993, this classification was used for 1992 as well.

FINDINGS: CHENEGA BAY

Chenega Bay General Overview of Uses of Areas in 1989

Almost all of the subsistence harvest areas of the community of Chenega Bay lay directly in the path of the oil spilled by the *Exxon Valdez*. Because of widespread concerns about oil contamination of resources, subsistence harvests at Chenega Bay dropped by almost 60 percent in the year after the spill compared to pre-spill averages (Fall 1991, Stratton et al., forthcoming). The study findings about uses of harvest uses are consistent with the harvest data. For most Chenega Bay harvest areas, the percentage of households using the area in 1989 was lower than that which had used the area regularly before the spill (Table 12). In a number of cases, areas that had had frequent use before the spill (Knight Island, Dangerous Passage, Knight Island Passage, Latouche Island, Latouche Passage, Montague Island) had little or even no use in 1989. After the first study year, use area questions focused on three areas; these are discussed below. What follows in this section are observations about some of the changes in uses of other areas in the spill year.

Large declines in the percentage of Chenega Bay households engaging in subsistence activities occurred in the passages between the islands in the western Sound. Before the spill, these were used for a variety of activities, such as marine mammal hunting, deer hunting along shorelines, marine

invertebrate gathering, waterfowl hunting, and fishing. Examples included: Dangerous Passage (39 percent using before the spill, 6 percent in 1989); Knight Island Passage (28 percent before the spill, none in 1989), Latouche Passage (44 percent before the spill, none in 1989); and Prince of Wales Passage (28 percent before the spill, 17 percent in 1989). Deer hunting on a number of islands dropped off sharply, as Chenega Bay hunters feared that deer had been eating oiled kelp. Examples include Chenega Island (22 percent before the spill, 11 percent in 1989), Knight Island (50 percent before the spill, 6 percent in 1989); Evans Island (50 percent before the spill, 28 percent in 1989); Latouche Island (50 percent before the spill, 11 percent in 1989); and Montague Island (11 percent before the spill, none in 1989). Table 12 also shows that in many areas, waterfowl hunting was avoided in 1989, and finfish fishing dropped off in several places as well.

In two notable cases, the percentage of Chenega Bay households using areas increased in 1989 compared to the percentage of households that had regularly used these areas before the spill. One area was Eshamby Bay, which was regularly used by 6 percent of the households before the spill, and 17 percent in 1989, all for salmon fishing. Also, while Jackpot Bay was used regularly by 22 percent of Chenega Bay households before the spill, this increased to 28 percent (all for salmon fishing) in 1989. This increase occurred because the Department of Fish and Game opened these areas to subsistence salmon fishing by emergency order to provide Chenega Bay residents with subsistence fishing opportunities in unoiled areas. These areas are normally closed to all fishing to protect milling salmon. In 1989, they were protected by absorbent booms and Chenega Bay residents considered the fish there safe to use (Stratton et al., forthcoming).

It should also be noted that the Alaska Department of Community and Regional Affairs provided Chenega Bay with an Oil Spill Community Assistance Grant in early 1990 to support travel by subsistence harvesters to unoiled portions of the sound. A harvesting trip, during which hunting and fishing occurred, took place in the spring of 1990 in the northeastern sound.

Sawmill Bay

Sawmill Bay, which lies just south of Chenega Bay, is the site of the Armin F. Koernig salmon hatchery. It was protected from oil contamination in 1989 by the deployment of absorbent and contaminant boom (Piper 1993:94-96). This bay has been used for the full range of subsistence fishing, gathering, and hunting activities since the resettlement of the village in 1984. Of the sample of Chenega Bay households, about 87 percent had engaged in at least one subsistence activity at Sawmill Bay; a majority of these households used this bay for salmon fishing, harvesting other fish, marine invertebrate gathering, land mammal hunting, marine mammal hunting, and bird hunting (Tables 13 - 17, Figs 29 - 37).

In the year after the spill, use of Sawmill Bay for subsistence activities dropped by almost half, from 87 percent of the households to just 48 percent. Although this decline in activity was large, more

households used Sawmill Bay, and its decline in use was less, than other areas that had not been protected by boom, such as Elrington Passage and the remainder of Evans Island. Use of Sawmill Bay remained at about 50 percent of the households in 1990 and 1991, and approached pre-spill levels of at least 80 percent of households in 1992 and 1993 (Fig. 29).

A substantial drop occurred in 1989 in the percentage of Chenega Bay households using Sawmill Bay for each resource category activity. Participation in salmon fishing dropped by almost half, and fishing for other finfish fell from 74 percent to just 22 percent. In subsequent years, there has been a gradual return to use of Sawmill Bay for fishing activities (Fig. 30, Fig. 31). Use of Sawmill Bay for marine invertebrate gathering (Fig. 32), land mammal hunting (Fig. 33), and marine mammal hunting (Fig. 35) was virtually absent in the first two years after the spill. Although use has increased since 1991, it remains below pre-spill levels. As is noted in the case household descriptions which follow, households which have resumed subsistence activities in Sawmill Bay report that their uses have not returned to pre-spill norms, generally because of resource scarcities.¹

Elrington Passage

In contrast to Sawmill Bay, portions of Elrington Passage were heavily oiled in 1989 as it lay in the direct path of the oil slick. Elrington Passage is a primary subsistence harvest area for Chenega Bay. Before the spill, about 74 percent of the households used this area for subsistence activities. This fell to just 13 percent in the year after the spill. There has been a gradual return to use of Elrington Passage (Figs 11 - 19). By 1993, none of the interviewed households did not use it, although 30 percent of the sub-sample was not interviewed in that study year (Fig. 11). However, as noted in the case studies below, there remains the perception of severely reduced resource populations in Elrington Passage.

Although a majority of Chenega Bay households used Elrington Passage before the spill for salmon fishing, harvesting other fish, marine invertebrate gathering, land mammal hunting (primarily deer), and marine mammal hunting, very few households used this area in the first two post-spill years for any of these activities. The level of use of this important harvest area has increased since 1991 for all subsistence activities, although it is noteworthy that very few households traveled to Elrington Passage to harvest marine invertebrates until 1993 (Fig. 14). Again, this increase must be qualified by the reports of hunters that because of much reduced resource populations, their uses of this area have not returned to pre-spill norms.

¹ The reader should consult the Exxon Valdez Oil Spill Restoration Plan, adopted by the Exxon Valdez Trustee Council (1994) for a summary of injuries to natural resources caused by the spill.

Evans Island

Oiling occurred along large portions of Evans Island in 1989, especially on its northwestern side. The pattern of use of Evans Island since the spill is similar to that of Elrington Passage. There was a sharp drop in all subsistence activities in 1989, from 83 percent using this area before the spill to about 22 percent in the first post-spill year. Also, except for land mammal hunting, almost no households used this area in 1990, the second post-spill year. By 1993, about 83 percent of the households were again using Evans Island for some activities, a similar percentage to before the spill. Lagging behind this general resumption in use was marine invertebrate gathering and marine mammal hunting (Table 17, Figs. 20 - 28).

Chenega Bay Case Households

The purpose of this section is to illustrate further the patterns of use of particular harvest areas by residents of Chenega Bay with several case household examples. These case studies also describe the reasons offered by the subsistence harvesters regarding changes to their uses of these areas.

Case Household A contains a middle-aged man from Old Chenega who has lived in Chenega Bay since the resettlement in 1984. He is a very active hunter and fisherman, one of the major providers of subsistence foods in the village. This man had used Sawmill Bay before the spill for the entire range of subsistence activities. In 1992, he reported that he had used the area since the spill for all activities except big game hunting and plant gathering. However, his use of Sawmill Bay had not returned to normal, basically because of resource scarcities:

I never see seals on Bettles [Island]. I hardly see any whales or sea lions. They used to come in here, too. Ducks aren't as abundant as they used to be. Clams -- [there are] not as many as before the oil spill.

For 1993, he basically provided the same response: his use of Sawmill Bay was still not back to normal. When asked "Why?" he replied:

I don't know. I think it's the oil that did it. It killed all the feed. All the plankton in the water got killed by the oil.

Regarding Evans Island, in 1992 this hunter said that:

I don't see the animals. We used to have eagles perched out here, and grouse, and porcupine.

Because of this scarcity, his use of Evans Island was different than before the spill. For 1993 he reported:

There's not much [around Evans Island]. Not as many land otters, ducks, geese. You don't see as much animals as you used to.

This man was also an active user of Elrington Passage before the spill. Here too, he described a perception of persistent scarcity.

It's dead. I don't see the little brown ducks. . . They're gone. There are fewer sea gulls and seals (1992).

I go out there when I get a chance. I think it's [scarcity] related to the oil spill. I don't know if it was safe to eat those things or not. . . Before the spill, there were seals all over. In every little bay you'd go to you'd see seals. Now there's a lot less (1993).

Case Household B is a younger man who had married a person from Old Chenega and moved to the community when it was resettled. This man had used Sawmill Bay for fishing, marine invertebrate gathering, marine mammal hunting, and bird hunting before the spill. Since the spill, he has only fished there. He blames the continued presence of oil in Prince William Sound and post-spill scarcities of resources for his reluctance to engage in subsistence activities in Sawmill Bay. He said regarding 1992 that:

Oil is at Bishop Rock, Sleepy Bay, Pt. Helen and comes through here. I've been here 17 years. Now you can run all day and count all the birds you see on one hand.

The same was true for 1993:

It's 95 percent lower use. The numbers are down so much I won't utilize [because] it will wipe out the species. I have a boat and go further out and take others from the village.

This man had used Evans Island before the spill for hunting and marine invertebrate gathering. Now, he just uses the area for big game hunting and plant gathering. When asked why his uses had not returned to pre-spill levels, he said:

[It's because of] the oil spill. Most all the animals use the ocean for salt, kelp, and it's still oiled. Land otters and mink are dead. I haven't seen an ermine in four years.

Before 1989, Case Household B had engaged in the full range of subsistence activities in Elrington Passage. However, since then, it is just used for fishing and land mammal hunting. The husband explained why:

Animals are fewer than ever before. Deer are having a bad time. They come to the north end in winter. All those beaches are soiled with oil.

Case Household C also has a younger, moderately active hunter and fisherman who was born in Old Chenega and has lived in Chenega Bay since its establishment. He reported consistently during the study that his use of the three case areas has not returned to pre-spill norms. When asked why, for Evans Island and Elrington Passage, he just responded with "Oil." He offered a further comment regarding Sawmill Bay, saying: "We were scared to use the area. The oil is still there, but you gotta use common sense." In the past, he used Sawmill Bay for all activities but plant gathering; since the spill, he has only fished there. Even so, he finds this and the other areas unproductive. Regarding all three in 1993, he said, "There's nothing there."

Case Household D contains another former Old Chenega resident and original inhabitant of Chenega Bay who is moderately involved in subsistence activities. His uses of the three case areas have not returned to their pre-spill patterns, he said, even though he has resumed his activities in each. Regarding Sawmill Bay, he reported

There's nothing to use here any more. I looked for steamers and found little bitty ones. Deer are quite rare compared to before the spill. Seal -- [I] used to go to Bettles Island. Now they're few and far between (1992).

There's nothing left here. I'm still afraid to eat the shellfish on the beaches around here (1993).

This man reported similar experiences when engaged in subsistence activities on and around Evans Island since the oil spill:

There are no more animals. Seals are gone, deer are thinning out. Bear are thinning out (1992).

We hunt and fish further way from the community now than we had to before. . . We have to use a bigger area now because of the [low] population of seals (1993).

Regarding Elrington Passage, this man stated that while he has hunted in this area, his success has been far lower than before the spill because "There are no animals."

Case Household E contains an Alutiiq man from another village who married a woman from Chenega. They moved to the new village when it was first established. They were active users of Sawmill Bay before 1989. The husband described this area as follows:

There was more animals, more deer, more ducks before the spill. It's quiet. There's no birds or ducks (1992).

They haven't returned, the octopus, clams, seals, sea lions, otters (1993).

The husband also reported that his use of Evans Island is not yet back to the pre-spill pattern, because his subsistence efforts are much less productive than before 1989. When asked to explain this difference, he said:

They keep telling us it's a bunch of stuff: could be a hard winter. I mainly get deer. I still blame it on the spill. At meetings a couple weeks ago, they didn't mention the spill. We argue with them. I disagree when they say the oil didn't have anything to do with it (1992).

[1993] There are less seals, sea lions. There is less of everything. Some sea lion and ducks have returned, but not to the level they were before.

He also described resource shortages in Elrington Passage and offered a clear explanation for the change:

It's the oil. The deer were eating the oiled kelp. There are fewer deer now. Deer are way down since I moved here in '83. I used to see them frequently. I didn't even get my limit last year. You have to walk miles and miles before you see them.

Case Household F contains a middle-aged man who is a primary marine mammal hunter and another Chenega Bay person originally from Chenega. In 1993, he said his use of Sawmill Bay still did not resemble his pre-spill subsistence patterns.

We used to get a lot of halibut in front of here. I don't know who's to blame there, longlines or the oil spill. It's less because the resources are fewer. I still don't know why all those clam shells are lying open on the beach.

And regarding Evans Island in 1993, he said:

There's nothing left -- a few ducks, but we leave them alone. There's deer, but we can't find them. You can't find any seal.

TATITLEK

Tatitlek: General Overview of Uses of Areas in 1989

Subsistence harvest levels in Tatitlek declined by about 60 percent compared to pre-spill averages in 1989 and declined further in 1990 (Fall 1991, Fall 1992, Stratton et al., forthcoming). The results of the series of harvest area questions provided further evidence of this decline and illustrated that many households avoided use of some of their normal harvest areas. In 1989, oil contamination

concerns were the primary reason for this avoidance; a number of important Tatitlek harvest areas lay directly in the path of the spilled oil, and there was a more general uncertainty about the safety of using any resources from Prince William Sound.

Table 18 summarizes the study findings for Tatitlek for 1989. In 1990 and subsequent study years, questions focused on three specific areas, and these are discussed below. For areas only documented for 1989, several showed sharp drops in levels of use. Many of these involved marine mammal hunting. Unakwik Inlet and Glacier Island had been used regularly for marine mammal hunting by 32 percent of Tatitlek households before the spill, but only 14 percent hunted there in 1989. Use of Port Fidalgo for marine mammal hunting dropped from 45 percent of households prior to 1989 to 27 percent after the spill. Drops also occurred in use of Knight Island/Dangerous Passage; Evans, Elrington and Latouche Islands; Port Nellie Juan; Port Gravina; and Port Wells. Also, use of Green Island and north Montague Island dropped sharply from 45 percent of households prior to the spill (mostly for deer hunting) to just five percent in 1989. Deer hunting also dropped off on Knight Island, Evans, Elrington and Latouche islands, and Naked, Perry, and Smith islands.

Tatitlek Narrows

Oil from the *Exxon Valdez* spill did not enter Tatitlek Narrows. This is an important area for Tatitlek for a variety of subsistence activities. Overall, 80 percent of the households in the sub-sample engaged in at least one subsistence activities in the Tatitlek Narrows area before the spill, with a majority hunting birds (60 percent), gathering marine invertebrates (52 percent), hunting marine mammals (68 percent), fishing for salmon (80 percent), and harvesting other fish (72 percent) (Tables 19 - 22; Fig. 56 - 64).

Levels of subsistence use of Tatitlek Narrows fell markedly in 1989 and remained unusually low in 1990 as well. For example, just 8 percent of the sub-sample hunted for birds there in 1989 and just 16 percent in 1990, compared to 60 percent before the spill. Shellfish showed a similar pattern. Few households used Tatitlek Narrows for marine mammal hunting (8 percent) and fishing for fish other than salmon (12 percent). Participation in subsistence salmon fisheries in Tatitlek Narrows also dropped in 1989 (to 32 percent of the sub-sample), although not as great as for the other categories (Table 19).

By 1991, more households were returning to subsistence uses in Tatitlek Narrows, and the percentage of the sub-sample using the area for at least one activity was the same as before the spill. Not until 1993 did the percentage of households using the area and the percentage of unknown households match the pre-spill level of use (Fig. 56).

Boulder Bay

Boulder Bay is southeast of Tatitlek and was not oiled in 1989. However, the percentage of households using this bay for subsistence activities dropped from 80 percent before the spill to 36 percent in 1989 (Fig. 47; Table 19). Participation levels for each resource category also dropped markedly. This illustrates the generalized concern that people in Tatitlek had in 1989 about oil contamination. Because of the mobility of most resources, Tatitlek residents believed that the effects of the spill could occur in areas that had not been directly oiled. This also illustrates one of the reasons why traveling to "unoiled" or "uncontaminated" areas of the sound was not an option for many Tatitlek and Chenega Bay residents in 1989.

By 1990, use of Boulder Bay by Tatitlek subsistence users was rebounding, to at least 52 percent of the sub-sample. However, use of the area for shellfish gathering, marine mammals hunting, and fishing was still below pre-spill norms. Use had probably reached pre-spill levels by 1993 (Fig. 47; Table 22).

Bligh, Reef, and Busby Islands

The third area included Bligh Reef, the site of the spill, plus Bligh, Reef, and Busby islands. As with the other two areas, subsistence activities were suspended for about half the households which normally used this area; while 80 percent of the sub-sample used this area for at least one activity before the spill, this dropped to 48 percent of the households in 1989 (Fig. 38). Most of this use was deer hunting on Busby Island. Few households engaged in bird hunting, shellfish gathering, marine mammal hunting, or fishing near any of these islands in 1989 (Table 19). By 1990, a few more households returned to this area for salmon fishing and hunting, but use levels remained quite low (Fig. 39, Fig. 42; Table 19). By 1993, it is likely that about the same percentage of households was using this area for at least one subsistence activity as had before the spill, with big game hunting clearly accounting for most of this activities. Compared to before the spill, use of Bligh, Reef, and Busby islands for such subsistence activities as bird hunting, marine invertebrate gathering, marine mammal hunting, and fishing, probably remained below pre-spill norms (Table 22, Figs. 39 - 45).

Case Household Examples: Tatitlek

The purpose of this section, as with the case households from Chenega Bay (above), is to illustrate the reasons which hunters and fishermen from Tatitlek have offered for why their uses of particular areas have not returned to normal since the oil spill.

Case Household A contains a man who is a life-long resident of Tatitlek and a very active hunter of deer, marine mammals, and birds, as well as a trapper. Although he was an active user of the Bligh, Reef, and Busby islands area before the spill, he avoided these areas from 1989 until 1993, when he reported that his uses had returned to normal because "the fish and sea otters have come back." On the other hand, although he returned to using the Boulder Bay area in 1991, his use of this area has not returned to normal. In 1993, he reported that:

I've been leaving the area alone to let them [all animals] come back. I didn't go there much last year

This man had used Tatitlek Narrows before the spill and each year after until 1993, when he reported that there was "too much traffic" in the narrows for effective hunting.

Case Household B contains a young man who has lived in Tatitlek all his life and is a moderately active hunter and fisherman. He did not use Tatitlek Narrows in 1989, but returned to subsistence activities there beginning in 1990. However, because of resource scarcities, his use of the area by 1993 was not typical of that before the spill. He explained that:²

I didn't get out much last year [because] there was less herring and less of everything else. A lot of things eat the herring.

He went on to explain that he did not hunt seals at all in the narrows in 1993 because:

With the herring, there's usually a lot more [seals] around. With the herring not here, what are they [seals and sea lions] eating now? There was more around before the oil spill. I used to make trips out to get them before the oil spill.

Case Household C contains a middle-aged man who is moderately active in subsistence activities. He used all three case areas before the spill and has hunted or fished in each in most years since the spill. However, in 1993 he reported that in none of these areas had his activities returned to normal, primarily because of resource scarcities that he blames on the spill. For example, he hunted deer and collected marine invertebrates at Bligh, Reef, and Busby islands before 1989. However, he no longer engages in either activity there, although he does fish for salmon in this area. In 1993, he explained that:

That's where the oil hit. There's no clams there anymore. There's been a tremendous decline in resources.

Although he has used Boulder Bay for fishing since 1990, in 1993 this man expressed suspicions about the quality of resources taken there, saying, "The salmon looked bad last year and there was no [herring]

² This respondent refers to the herring run failure in Prince William Sound in 1992 and 1993. For a discussion of effects of this run failure on subsistence uses in Prince William Sound, see the chapters on Tatitlek and Chenega Bay in Fall and Uttermohle, forthcoming.

spawn." In Tatitlek Narrows, he reported that "The resources aren't there anymore." His family had used this area for a wide range of subsistence activities before the spill and had also done so in 1989 and 1991. However, because of resource scarcities, no one from this households did any subsistence activities in Tatitlek Narrows in 1993.

Case Household D is an example of a Tatitlek family that has avoided use of the Bligh Reef area since the oil spill because of contamination concerns. The family consists of a lifelong Tatitlek resident and non-Native spouse and their children. Regarding the Bligh Island area, the wife explained that:

Since the oil spill, we just don't go over there. It doesn't seem like the place to go anymore. We just don't want to go there.

This family has generally also cut back on there subsistence activities in Tatitlek Narrows because, "There's not enough resources."

Case Household E contains an Alaska Native man from another community who is married to a lifelong Tatitlek resident. He is a very active hunter. He used the Bligh, Reef, and Busby islands areas for the full range of fishing, hunting, and gathering activities before the spill. Although he has returned to this area every year since the spill for hunting and fishing, these trips are much less productive than before. When asked to explain why, he answered, "Due to crude, the resources are not as abundant. I have given up on octopus." He also said he now finds less salmon and less marine mammals at Boulder Bay and Tatitlek Narrows. In 1993, however, he was optimistic about increasing numbers of "black ducks" (scoters) in Tatitlek Narrows.

NANWALEK

In 1989, subsistence harvests dropped at Nanwalek by about 51 percent compared to the single pre-spill estimate from 1987 (Fall 1991, Stanek, forthcoming). Subsistence activities in certain traditional harvest areas also declined in the year after the spill. For example, while 36 percent of Nanwalek's households regularly used the Port Graham area for subsistence activities, just 21 percent did so in 1989; 18 percent regularly fished there, but none did in 1989. No households used the Windy Bay/Rocky Bay/Chugach Bay area in 1989, although 9 percent regularly did so in the past (Table 23).

Data were collected for two study years, 1989 and 1990, for three harvest areas: English Bay, Port Graham Bay, and Yukon Island. For English Bay, most households engaged in a variety of subsistence activities before the spill and most used the area in 1989 as well. However, in the first post spill year, there was a decline in the percentage of households using this area for harvesting fish other than salmon, marine mammal hunting, and bird hunting. These percentages increased to approximate pre-spill norms in 1990. As noted above, use of Port Graham by Nanwalek residents dropped in 1989,

especially for salmon fishing. This was primarily because of contamination concerns and time constraints caused by work on the spill cleanup. Again, in 1990, use of this area rebounded for salmon fishing, its primary use by residents of Nanwalek.

The third area, Yukon Island illustrated a slightly different pattern. This area, which includes Kasitsna Bay, Jakalof Bay, Tutka Bay, Sadie Cove, and China Poot Bay as well as Yukon Island, is used by Nanwalek primarily for marine mammal hunting, shellfish gathering, and some bird hunting. In 1989, use dropped only slightly, from 53.1 percent regularly using to 47 percent using. However, only 27 percent of the households used the Yukon Island area in 1990, caused by a drop in both marine mammal hunting and shellfish gathering. Overall, Nanwalek's marine mammal harvest was particularly low in 1990, lower than any other year for which data are available (Wolfe and Mishler 1993). Hunters attributed this decline to a scarcity of animals. This scarcity may have discouraged some hunters from traveling to Yukon Island to hunt seals.

POR GRAHAM

As at Nanwalek, subsistence harvests at Port Graham dropped by about 50 percent in 1989 compared to the pre-spill estimate for 1987 (Fall 1991, Stanek, forthcoming). Generally, there were only slight drops in the percentage of Port Graham households "regularly" using particular areas for at least one harvest activity in 1989 compared to pre-spill norms. Examples include English Bay and Seldovia Bay. There were, however, a number of examples of reductions in use of areas for particular subsistence activities. For example, a few Port Graham households (4 percent) regularly traveled to the Port Chatham/Elizabeth Islands area before the spill to hunt seals, but none did so in 1989, probably because of the presence of oil in this area. There was also a reduction in marine mammal hunting in the Windy Bay area (from 6 percent regularly using to 2 percent); this was another heavily oiled area (Table 26).

Further examples are provided by the three areas for which data were collected for both 1989 and 1990. These were Port Graham, English Bay, and Yukon Island (Table 27, Table 28). In both 1989 and 1990, a slightly lower percentage of Port Graham community households was active in subsistence activities in Port Graham than before the spill. In 1989, the largest declines occurred in fishing for nonsalmon fish (87.5 percent using the area regularly before the spill, 58.3 percent in 1989) and shellfish (95.8 percent before the spill, 60.4 percent in 1989). This decline most likely reflects concerns about oil contamination of these resources. There was a slight increase in participation in both of these activities in 1990.

In 1989, 22.9 percent of the interviewed Port Graham households reported that they regularly used the English Bay area for subsistence activities, mostly for nonsalmon fishing, but this dropped to 14.6 percent in 1989. Use increased substantially in 1990, with 32.6 percent of Port Graham households

using the English Bay area, mostly for finfish fishing and marine invertebrate gathering. This may reflect a renewed confidence among some households about the safety of these resources.

As in Nanwalek, the percentage of Port Graham households hunting marine mammals in the Yukon Island area decreased from 1989 to 1990, as did the community's overall marine mammal harvest (Wolfe and Mishler 1993). Unlike Nanwalek, the percentage of Port Graham household harvesting marine invertebrates in the Yukon Island case study area, which includes Kasitsna Bay (a prime claming area), increased substantially from 16.7 percent of all households in 1989 to 32.6 percent in 1990. Only 16.7 percent of Port Graham's households in 1989 said they regularly used Yukon Island/Kasitsna Bay area for shellfish gathering, although 39.1 percent in 1990 said they had used the area at times before the spill. This finding may be further evidence of a shift in marine invertebrate harvest areas due to scarcities nearer Port Graham, which local residents attribute, at least in part, to increasing sea otter populations.

OUZINKIE

Most of the oiling that occurred in western Alaska from the *Exxon Valdez* spill, including the Kodiak Island Archipelago, was classified as "very light," although sections of beaches were heavily or moderately oiled (U.S. Coast Guard 1993:125). In 1989, subsistence harvests in Ouzinkie dropped substantially compared to pre-spill averages (Fall 1991, Mishler and Cohen, forthcoming). Correspondingly, use of many subsistence harvest areas by Ouzinkie residents dropped in 1989 compared to before the spill. For all but the three areas listed in Table 11, data were only collected for 1989. Among the notable changes in the spill year was a decline in use of Danger Bay for salmon fishing, from 17 percent regularly using before the spill to just 3 percent in 1989; and a drop in hunting activity at Entrance Point and Neva Cove, from 23 percent of the households regularly using to 6 percent using in 1989. As in Port Lions (see below), a number of Ouzinkie households avoided salmon fishing at Litnik in 1989 (6 percent fishing compared to 17 percent regularly using the area before the spill and 20 percent fishing there in 1988). Deer hunting also dropped off notably at Litnik (Table 29).

For three of the significant harvest areas for Ouzinkie residents, Camels Rock, Procada Island/Cat Island, and Sourdough Flats, use information was collected for two post spill years, 1989 and 1990 (Table 30, Table 31). Before the spill, most households in Ouzinkie engaged in subsistence activities at Camels Rock, especially salmon and other fishing, bird hunting, and shellfish gathering. Overall, in 1989, 92.0 percent of the sampled households said they used the Camels Rock area regularly for subsistence activities before the spill, but use fell to 56 percent of the households in 1989. The following study year, 84.6 percent of the sample said they had used this area before the spill, and 53.7 percent afterwards. Accounting for much of this change was a sharp decline since the spill in marine invertebrate gathering at Camels Rock. About half the 1989 sample had harvested marine invertebrates here regularly before the spill, but this dropped to 16 percent in 1989. Of the 1990 sample, 74.4 percent

had used Camels Rock prior to the spill for shellfish gathering, compared to 39 percent since the spill. Oil contamination of shellfish was a particularly important concern in Ouzinkie in the years following the spill, and the reluctance on the part of many households to return to harvesting these resources illustrates the persistence of their distrust of the safety of marine invertebrates.

The strong concern by Ouzinkie residents about oil contamination of shellfish is illustrated by the findings for the two other case areas, Procada Island/Cat Island and Sourdough Flats, both of which are used primarily for marine invertebrate gathering (Table 30, Table 31). As illustrated in Figure 65, there was a substantial drop in both study years in the percentages of sampled households which used either place for marine invertebrate gathering compared to before the spill. It should also be noted that the 1990 sample included a much larger percentage of households which indicated using this area, since in 1989 respondents had been asked only if they had used the area "regularly" before the spill. The increase in the percentage of households using these areas in 1990 over 1989 may reflect in part a difference in the sample, since a random sample of 50 percent of households was selected in 1989 and a census of all households was attempted for 1990. Nevertheless, the results suggest an increased use in 1990 over 1989, although usage was still below pre-spill levels.

LARSEN BAY

Subsistence harvests dropped in Larsen Bay in 1989 compared to pre-spill averages, but the decline was not as great as in Ouzinkie or the communities of Prince William Sound and lower Cook Inlet. Larsen Bay's harvests rebounded in 1990 (Fall 1991, Fall 1992). The study findings for Larsen Bay regarding harvest areas appear, for the most part, inconclusive in depicting any substantial change in use patterns in 1989 or 1990. Use of certain areas which were not oiled appears to have increased in 1989 compared to before the spill. An example is Amook Island, which increased from 8.8 percent of the households regularly using before the spill to 23.5 percent using in 1989. On the other hand, the research did not document large declines in uses of areas where oiling had occurred. An example is Chief Point (Bird Rock). For the 1989 sample, 25 percent of the households had used this area regularly, all for bird hunting, while 20.8 percent went there in 1989, mostly for bird hunting but also for salmon fishing and shellfish gathering. For the 1990 sample, the same percentage (52.8 percent) used Chief Point before the spill as used the area in 1990.

There was also inconsistency across the two study years in the percentage of the samples which reportedly used each area prior to the spill, especially regarding Chief Point and Spiridon Bay (Table 33, Table 34). For the former, 25.0 percent of the 1989 sample said they used the area "regularly" before the spill, exclusively for bird hunting. However, 52.6 percent of the 1990 sample said they had used Chief Point before the spill, for a variety of activities. The findings regarding Spiridon Bay were even more divergent. Just 8.3 percent of the 1989 sample said they had used this area "regularly" before 1989, while 47.4 percent of the 1990 sample said they had used the area in pre-spill years. Of course,

part of the difference is accounted for by the way the questions were asked the two study years. For 1989, respondents were asked if they used the area "regularly," while in 1990, they were only asked if they had used the area before the spill. In most other communities, however, differences caused by this change in the question appeared to be of a lesser magnitude than at Larsen Bay. Generally, it appears that the 1990 findings are more representative of pre-spill use patterns by Larsen Bay residents for these areas. If this is the case, the findings also suggest that by 1990, subsistence uses of these areas by residents of Larsen Bay were similar to pre-spill patterns.

KARLUK

Subsistence harvests in Karluk dropped about 60 percent compared to pre-spill averages in 1989, but increased to match one pre-spill estimate in 1990 (Fall 1991, Fall 1992). Harvest area information was collected in Karluk for 1989 and 1990. In the latter study year, data were only collected for three areas: Halibut Bay, the Karluk Village area, and the Sturgeon River. Light oiling occurred along portions of these areas. Although declines in use levels were recorded for several harvest areas, the degree of decline was far lower than at Ouzinkie (Table 35, Table 36, Table 37). For example, use of Halibut Bay dropped from 23 percent of Karluk households regularly using the area before the spill to 8 percent using in 1989 because a decline in marine invertebrate gathering and marine mammal hunting there. For the 1990 study year, 56.3 percent of the households reported using Halibut Bay before the spill, and 31.3 percent had done so since the spill. This indicates that an increase in use activities there had taken place between 1989 and 1990. There was also more use of the Sturgeon River area in 1990 than in 1989, suggesting that households were rebounding from any disruptions that had occurred in their uses in this area during the oil spill year.

PORT LIONS

Harvest area questions were only administered in Port Lions for the 1989 study year. The findings are reported in Table 38. With a few exceptions, the findings do not suggest a large shift in harvest locations in the year after the spill or non-use of a large number of areas. A few changes were indicated, however. Fewer households hunted deer in the Kizhuyak Bay area in 1989 (28 percent) than regularly hunted there (42 percent). Concern was expressed at a public meeting in Port Lions in 1989 about oiling at Litnik. Fewer household fished for salmon there in 1989 (28 percent) than did regularly (42 percent) and general use of this area fell from 47 percent of the households regularly using before the spill to 33 percent using in 1989. There also appeared to be a drop in fishing activities in the Whale Island and Whale Passage area.

AKHIOK

Table 39 lists the areas for which use information was collected for the 1989 study year in Akhiok, the only year for which harvest area data were collected in this village. For every area, there was little or no difference in the percentage of sampled households which had used the area before the spill compared to 1989. This lack of any evidence of avoidance of harvest areas also pertains to the category level. Particularly notable is the finding regarding shellfish; of the five areas used before the spill, all were used by an equal percentage of households in 1989. (It should be noted, however, that a change in the intensity of use of these areas, or in their productivity, would not have been detected by the survey. See the methods section, above.) These findings are consistent with other results of the harvest surveys, which found a relatively small reduction in levels of subsistence harvests in Akhiok in 1989 compared to most other Kodiak Island Borough communities (Fall 1991, Mishler and Cohen, forthcoming). This may be explained by the relatively low level of oil contamination along this portion of Kodiak Island.

OLD HARBOR

Harvest area questions were only asked in Old Harbor for the 1989 study year. The findings are reported in Table 40. No evidence was found of substantial shifts in harvest locations in the year after the oil spill. In almost all cases, the percentage of sampled households which reported using areas regularly before the spill also used these areas in 1989. There were also no discernible differences at the category level in the percentage of households using the areas before and after the spill. It should be noted that very little oiling occurred in Old Harbor's traditional harvest areas, although a general concern about oil contamination had been expressed by some village residents in 1989.

ALASKA PENINSULA COMMUNITIES

As at Kodiak, most of the oiling that occurred along the Alaska Peninsula was classified as "very light" (U.S. Coast Guard 1993:125). Alaska Peninsula communities included in the study were Chignik Bay, Chignik Lagoon, Chignik Lake, Perryville, and Ivanof Bay. Figure 10 illustrates the areas used to collect harvest area data for the 1989 study year in the five Alaska Peninsula study communities, the only year in which this series of questions was administered there. The findings are presented in Tables 41 through Table 45. Overall, the research did not find evidence of large shifts in harvest areas from 1988 to 1989, nor was there much difference between areas used in 1989 and those areas regularly used for particular subsistence activities. It is possible that certain areas were avoided for portions of the first post spill year, but were returned to before the year was over. Other study findings documented disruptions to subsistence activities in these communities in the year of the spill. Certain resources

suspected of being contaminated by oil were discarded and many households were especially suspicious of shellfish. However, subsistence harvests in 1989 showed little change, or, in the case of Chignik Lake, were higher (because of an increased caribou harvest), than the single pre-spill estimate for 1984 (Fall et al., forthcoming).

DISCUSSION AND CONCLUSIONS

Overall, this review of the use area data collected in communities of the oil spill area supported other study findings regarding the effects of the spill on subsistence uses. These effects have exhibited a geographic and temporal pattern. In 1989, the greatest declines in subsistence harvests occurred in the Prince William Sound villages, the lower Cook Inlet villages, and Ouzinkie in the Kodiak Island Borough. These were also the communities which this study found to have the greatest disruptions in uses of traditional harvest areas. With time, subsistence harvests have rebounded since the first oil spill year, with recovery slowest in Tatitlek and Chenega Bay, where subsistence harvests in 1993/94 remained below pre-spill norms. So too, respondents in these two Prince William communities almost universally reported that their uses of traditional harvest areas such as Elrington Passage and Tatitlek Narrows, had changed since 1989, largely because of perceived declines in resource populations which they blame on the spill.

In 1989, a primary effect of the spill on subsistence use areas was to discourage hunters and fishermen from any use of particular areas because of a generalized concern about the possible contamination of resources by the oil. This effect was most strongly documented for Chenega Bay and Tatitlek, and was found at Nanwalek and Ouzinkie as well. Consequently, with few exceptions, there was not a shift from use of certain areas to use of other, less-often used places. An exception occurred in a few areas in the western sound, such as Eshamy Bay and Jackpot Bay, that were protected from oiling and were opened to use by Chenega Bay residents.

In explaining changes in harvest levels, respondents for 1989 were mostly likely to cite contamination concerns, while in later years, resource scarcities, often attributed to the oil spill, were the most common explanation for lowered subsistence uses (Fall 1991; Fall and Utermohle, forthcoming). This matches the findings for changes in uses areas. Generalized fear of contamination discouraged subsistence activities in many areas in 1989. Subsequently, people have returned to these areas to hunt and fish, sometimes despite lingering contamination concerns, but their uses are not "normal," they report, because the populations of many valued resources appear to be depressed.

Study findings regarding these effects of the spill on uses of particular areas must be qualified because of certain limitations of the study. Documentation of use of each harvest area was limited to whether or not the area had been used at any time during the study year for each harvest activity. No attempt was made to quantify the level of use (such as number of trips or length of trips) or to measure the relative productivity of certain areas before and after the spill. This approach appears to have

worked in documenting the major disruptions to uses of harvest areas in Prince William Sound, and to a lesser extent lower Cook Inlet and Ouzinkie. However, the extent of harvest area disruptions in other communities may have been underestimated by this approach if the effect of the spill was to reduce the amount of time spent in particular harvest rather than eliminate use of the area entirely. This qualification probably applies to all the communities of the oil spill area, for oiling of beaches and subsequent clean up activities occurred in the traditional harvest areas of all of them and almost certainly at least temporarily disrupted subsistence activities in these areas.

The study also illustrates the importance of combined quantified data from systematic surveys with case household information. Without the explanations for current patterns of use of selected areas in Prince William Sound, the data which depict a gradual return to harvest activities in these areas could be misinterpreted to demonstrate that subsistence activities have returned to normal. As strongly demonstrated in the sections above on Chenega Bay and Tatitlek based on the reports of virtually every respondent, this is not the case. The common theme has been that despite increasing efforts, harvests and use patterns remain different from those before the spill. The research design for future studies of the impacts of environmental disasters on the geography of subsistence harvesting should include case studies and key respondent interviews, as well as systematic interviewing as presented in this report.

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Table 1. Sample Sizes for Subsistence Harvest Area Information

Community	1903		1939		1951		1962		1972	
	Households Surveyed	Percent								
Chenega Bay	18	85.7%	18	85.7%	18	81.8%	23	88.5%	23	82.1%
Tatitlek	22	78.6%	17	60.7%	19	70.4%			20	71.4%
Nanwalek	33	80.5%	35	85.4%						
Port Graham	48	78.7%	46	83.6%						
Akhiok	10	76.9%								
Karluk	14	82.4%	17	89.5%						
Larsen Bay	34	87.2%	35	87.5%						
Old Harbor	48*	51.6%								
Ouzinkie	35*	50.7%	53	89.8%						
Port Lions	36*	53.7%								
Chignik	35	89.7%								
Chignik Lagoon	15	100.0%								
Chignik Lake	21	75.0%								
Ivanof Bay	7	100.0%								
Perryville	27	87.1%								

* Randomly-selected sample

** Research conducted but use area data not collected; see Fall and Utternohle, forthcoming.

Table 2. Subsistence Use Areas, Chenega Bay

- A. Sawmill Bay
- B. Evans Island
- C. Elrington Passage
- D. Elrington Island and Point Elrington
- E. Latouche Passage
- F. Latouche Island
- G. Montague **Strait**
- H. Montague Island (unoiled portion)
- I. Green Island and North Montague Island
- J. Knight Island
- K. Fidalgo
- L. Naked Perry, and **Smith** Island
- M. Unakwik **Inlet**, Glacier Island
- N. Port Wells, College Fjord, **Coghill**
- O. Nellie Juan, Kings Bay
- P. Eshamy
- Q. Dangerous Passage, Whale Bay
- R. Chenega Island
- S. Knight Island Passage
- T. Jackpot Bay
- U. Icy Bay
- V. Bainbridge Island and Bainbridge Passage
- W. Prince of Whales Passage
- X. West Sound
- Y. Valdez Arm
- Z. **Tatitlek**/ Bligh Island

Table 3. Subsistence Use Areas, Tatitlek

- A. Tatitlek Narrows
- B. Bligh, Reef, and Busby Islands
- C. Tatitlek and **Ellamar**
- D. Valdez Arm
- E. Columbia and Long Bay
- F. Unakwik Inlet, Wells Bay
- G. Port Wells
- H. Prince William Sound
- I. Nellie Juan
- J. Knight Island Passage, Dangerous Passage
- K. Knight Island
- L. Icy Bay
- M. Evans, Elrington, Latouche Island
- N. Nontague Strait
- O. Montague Strait
- P. Green and North Montague
- Q. Hinchinbrook Island
- R. Hawkins Island
- S. Copper River Delta
- T. Orca Bay/ Orca Inlet
- U. Port Gravina
- V. Port Fidalgo
- W. Boulder Bay

Table 4. Subsistence Use Areas, Nanwalek and Port Graham

- A. Port Graham Bay
- B. English Bay
- C. **Koyuktulik Bay**
- D. Seldovia Bay
- E. Yukon Island
- F. Windy Bay
- G. Port **Chatham**

Table 5. Subsistence Use Areas, Akhiok

- A. Old Cannery/ Akalura Creek/ Silver Salmon Lake
- B. Upper Station/ Upper Olga Bay
- C. Olga Lakes
- D. Dog Salmon Creek/ Horse Marine Creek, Lower Olga Bay
- E. Moser Bay/ Fossil Point/ Bun Point
- F. Akhiok/ Lagoon/ Little Narrows
- G. Kempff Bay/ Sukhoi Lagoon
- H. Lazy Bay/ Tanner Head/Cape Alitak
- I. Middle Reef
- J. Alitak Bay
- K. **Deadman Bay**
- L. Cape Hepburn/ Salua Bay/ Portage Bay
- M. Aliulik Peninsula/ Old Village
- N. Two-Headed Island

Table 6. Subsistence Use Areas, Karluk and Larsen Bay

- A. Larsen Bay (general - all of bay, village beaches, and mountains)
 - AA Head of Larsen Bay
 - AB Inside Larsen Bay (includes Jacob Aga's Beach)
 - AC Larsen Bay Channel (from Frenchie out toward Uyak including **Humpie** Creek, Larsen Bay
village beacon, the lagoon, beach across, boneyard beach.)
- B. Outer Uyak
- C. Inside Uyak Bay (waters, Browns Lagoon, **Carlson Pt.**)
 - CA Amook Island
- D. Head of Uyak Bay
- E. **Zachar Bay**
- F. Spiridon Bay
- G. Chief Point (Bird Rock)
- H. Karluk Village area, lagoon and mouth of Karluk River
- I. Karluk River (including portage)
- J. Karluk Lake
- K. Sturgeon River
- L. Sturgeon Head
- M. Shelikof
- N. Halibut Bay

Table 7. Subsistence Use Areas, Old Harbor

- A. Ugak Bay
- B. **Kiliuda/ Shearwater/ Santa Flavia/ Boulder Bays**
- C. North Sitkalidak **Strait**
- D. Midway Bay/ Big Creek/ Sheep Island
- E. Fox Lagoon
- F. Cape **Barnabus/ Seal Bay**
- G. Port Hobron
- H. Aimee Bay/ Mouse Island
- I. Ocean Bay
- J. Rolling Bay
- K. Natal& Bay
- L. Newman Bay
- M. West Sltkalidak Island/ Perdado
- N. Old Harbor
- O. **Barling Bay and Beach**
- P. East Sltkalidak Strait
- Q. South Sltkalidak Strait
- R. Three Saints Bay
- S. Kaiugnak Bay
- T. Kiavak Bay
- U. Kaguyak/ Jap Bays and Two Headed Island
- V. Outside Sitkalidak Waters

Table 8. Subsistence Use Areas, Port Lions

- A. General Kizhuyak
- AB Inner Kizhuyak including Barabara Cove and inside Kikur Pt.
- AC Port Lions
- B. Sheratine Including Kikur Pt.
- C. Anton Larsen
- D. Shakmanof Cove (Women's Bay)
- E. Windy Pt.
- F. Doctor's River
- G. Soldiers Lagoon
- H. Camel's Rocks
- I. NE Afognak: E Pillar Cape to E Shugyak Strait
- J. Shuyak and NW Afognak to Black Cape, Pt. William
- K. Paramonof and Foul Bay
- L. Malina Bay
- M. Viekoda Bay
- N. Terror Bay
- O. Vyanik including Sally Island, Village Island
- P. Spruce Island and Ouzinkie Narrows
- Q. Kupreanof Strait, Port Bailey
- R. Raspberry Island and Strait, Musomee, Selief, The Slough
- S. Whale Island
- T. Litnik - Afognak Bay, Hog Island
- U. Marka Bay
- V. Danger Bay
- W. Mary Anderson, Little Afognak

Table 9. Subsistence Use Areas, Ouzinkie

- A. Kizahuyak Bay, Barabara Cove, Kekur Pt.
- B. Sharatin Bay
- C. Auton Larsen Bay
- D. Shakimanof Cove, "Women's Cove"
- E. Windy Pt.
- F. Doctors River
- G. Soldier's Lagoon (Bay)
- H. Camel's rock
- I. Entrance Pt., Neva Cova, "right across the Narrows"
- J. Course Pt.
- K. Sourdough Fiats
- L. **Procoda** island, Cat Island
- M. Ouzinkie Harbor, including the dock, Spilt Rock
- N. Katmai Creek
- O. Lakes on Spruce island
- P. nelson island, Eider island
- Q. icon Bay, Monk's Lagoon
- R. Knee Bay, Big Lagoon
- S. North Cape
- T. Triplets
- U. Pineapple Beach, Garden Pt., Mageshut Pt.
- V. Airport Beach, Other Side.
- W. Hupreanof Strait, Port Bailey
- X. Raspberry island, Selief, The Slough
- Y. Litnik
- AA. **Marka** Bay
- BB. Danger Bay
- c c Mary Anderson, Liiie Afognak
- DD. Marmot Bay
- EE. Monashka Bay
- FF. Chiniak
- GG. Rosslyn Beach/ Sandy Beach

Table 10. Subsistence Use Areas, Alaska Peninsula Communities

- A. Chignik Bay
- B. Chignik Lagoon
- C. Chignik Lake
- D. Black Lake
- E. Castle Bay
- F. Kujulik Bay
- G. Aniakchak/ Amber Bay
- H. Yantami Bay and east
- I. **Ilnik/ Seal islands**
- J. Castle Cape
- K. Domer Bay (Kuiukta Bay)
- L. Mitrofania Bay
 - L1** Mitrofania Bay
 - L2** Anchor Bay
 - L3** Mitrofania Island
- M. Perryville/ Anchor Bay
- N. Humpback Bay
- O. **Ivanof Bay**
- P. East Stepovak
- Q. Stepovak Fiats
- R. Northwest Stepovak
- S. Southwest Stepovak
- T. Balboa Bay
- U. Beaver Bay
- V. Shumagin islands
- W. Pavlof Bay
- X. West of Pavlof Bay

Table 11. Areas used to Collect Use Area Information, 1990, 1991, 1992, and 1993 Study Years

<u>Community</u>	<u>Areas</u>
Data collected for 1990, 1991, 1992, and 1993:	
Chenega Bay	Sawmill Bay Evans Island Elrington Passage
Data collected for 1990, 1991, and 1993:	
Tatitlek	Bligh Island, Reef Island, and Busby Island Boulder Bay Tatitlek Narrows
Data collected for 1990 only:	
Port Graham and Nanwalek	Port Graham Bay English Bay Yukon Island
Karluk	Sturgeon River Karluk Lagoon Sturgeon Head
Larsen Bay	Chief Point (Bird Rock) Larsen Bay Channel Spiridon Bay
Ouzinkie	Camels Rock Procoda Island and Cat Island Sourdough Flats

Table 16. Area Use Patterns for Preselected Areas, Chenega Bay, 1992

Area Name	Resource	Pre Spill						Post Spill					
		Not Present		No Response		Total Response		Used		No Response		Total Response	
		%	N	%	N	%	N	%	N	%	N	%	N
Sawmill Bay	All Resources	17.4	4	4.3	1	78.3	18	77.8	14	22.2	4	4.3	1
Sawmill Bay	Salmon	17.4	4	4.3	1	78.3	18	72.2	13	27.8	5	4.3	1
Sawmill Bay	Finfish	17.4	4	4.3	1	78.3	18	72.2	13	27.8	5	4.3	1
Sawmill Bay	Big Game	17.4	4	4.3	1	78.3	18	44.4	8	55.6	10	4.3	1
Sawmill Bay	Furbearers	17.4	4	4.3	1	78.3	18	16.7	3	83.3	15	4.3	1
Sawmill Bay	Marine Mammals	17.4	4	4.3	1	78.3	18	61.1	11	38.9	7	4.3	1
Sawmill Bay	Birds	17.4	4	4.3	1	78.3	18	55.6	10	44.4	8	4.3	1
Sawmill Bay	Shellfish	17.4	4	4.3	1	78.3	18	72.2	13	27.8	5	4.3	1
Sawmill Bay	Plants	17.4	4	4.3	1	78.3	18	27.8	5	72.2	13	4.3	1
Sawmill Bay	Other	17.4	4	4.3	1	78.3	18	0.0	0	100.0	18	4.3	1
Evans Island	All Resources	17.4	4	4.3	1	78.3	18	88.9	16	11.1	2	4.3	1
Evans Island	Salmon	17.4	4	4.3	1	78.3	18	44.4	8	55.6	10	4.3	1
Evans Island	Finfish	17.4	4	4.3	1	78.3	18	33.3	6	66.7	12	4.3	1
Evans Island	Big Game	17.4	4	4.3	1	78.3	18	61.1	11	38.9	7	4.3	1
Evans Island	Furbearers	17.4	4	4.3	1	78.3	18	38.9	7	61.1	11	4.3	1
Evans Island	Marine Mammals	17.4	4	4.3	1	78.3	18	44.4	8	55.6	10	4.3	1
Evans Island	Birds	17.4	4	4.3	1	78.3	18	50.0	9	50.0	9	4.3	1
Evans Island	Shellfish	17.4	4	4.3	1	78.3	18	66.7	12	33.3	6	4.3	1
Evans Island	Plants	17.4	4	4.3	1	78.3	18	72.2	13	27.8	5	4.3	1
Evans Island	Other	17.4	4	4.3	1	78.3	18	0.0	0	100.0	18	4.3	1
Erlington Passage	All Resources	17.4	4	4.3	1	78.3	18	66.7	12	33.3	6	4.3	1
Erlington Passage	Salmon	17.4	4	4.3	1	78.3	18	44.4	8	55.6	10	4.3	1
Erlington Passage	Finfish	17.4	4	4.3	1	78.3	18	50.0	9	50.0	9	4.3	1
Erlington Passage	Big Game	17.4	4	4.3	1	78.3	18	50.0	9	50.0	9	4.3	1
Erlington Passage	Furbearers	17.4	4	4.3	1	78.3	18	27.8	5	72.2	13	4.3	1
Erlington Passage	Marine Mammals	17.4	4	4.3	1	78.3	18	61.1	11	38.9	7	4.3	1
Erlington Passage	Birds	17.4	4	4.3	1	78.3	18	38.9	7	61.1	11	4.3	1
Erlington Passage	Shellfish	17.4	4	4.3	1	78.3	18	33.3	6	66.7	12	4.3	1
Erlington Passage	Plants	17.4	4	4.3	1	78.3	18	38.9	7	61.1	11	4.3	1
Erlington Passage	Other	17.4	4	4.3	1	78.3	18	0.0	0	100.0	18	4.3	1

Table 19. Area Use Patterns for Preselected Areas, Tatitlek, 1989

		Sample Size = 22						Post Spill											
Area Name	Resource	Not Present			Pre Spill			Used			No Response			Total			Used		
		%	N	%	No Response	%	N	Total	Yes	%	No Response	%	N	Total	Yes	%	N	No	
Tatitlek Narrows	All Resources	0.0	0	18.2	4	81.8	18	77.8	14	22.2	4	13.6	3	86.4	19	68.4	13	31.6	6
Tatitlek Narrows	Salmon	0.0	0	18.2	4	81.8	18	50.0	9	50.0	9	13.6	3	86.4	19	47.4	9	52.6	10
Tatitlek Narrows	Finfish	0.0	0	18.2	4	81.8	18	44.4	8	55.6	10	13.6	3	86.4	19	21.1	4	78.9	15
Tatitlek Narrows	Big Game	0.0	0	18.2	4	81.8	18	0.0	0	100.0	18	13.6	3	86.4	19	0.0	0	100.0	19
Tatitlek Narrows	Marine Mammals	0.0	0	18.2	4	81.8	18	16.7	3	83.3	15	13.6	3	86.4	19	10.5	2	89.5	17
Tatitlek Narrows	Birds	0.0	0	18.2	4	81.8	18	33.3	6	66.7	12	13.6	3	86.4	19	10.5	2	89.5	17
Tatitlek Narrows	Shellfish	0.0	0	18.2	4	81.8	18	33.3	6	66.7	12	13.6	3	86.4	19	21.1	4	78.9	15
Bligh, Reef, and Busby Islands	All Resources	0.0	0	18.2	4	81.8	18	83.3	15	16.7	3	13.6	3	86.4	19	73.7	14	26.3	5
Bligh, Reef, and Busby Islands	Salmon	0.0	0	18.2	4	81.8	18	38.9	7	61.1	11	13.6	3	86.4	19	10.5	2	89.5	17
Bligh, Reef, and Busby Islands	Finfish	0.0	0	18.2	4	81.8	18	27.8	5	72.2	13	13.6	3	86.4	19	0.0	0	100.0	19
Bligh, Reef, and Busby Islands	Big Game	0.0	0	18.2	4	81.8	18	66.7	12	33.3	6	13.6	3	86.4	19	73.7	14	26.3	5
Bligh, Reef, and Busby Islands	Marine Mammals	0.0	0	18.2	4	81.8	18	38.9	7	61.1	11	13.6	3	86.4	19	21.1	4	78.9	15
Bligh, Reef, and Busby Islands	Birds	0.0	0	18.2	4	81.8	18	27.8	5	72.2	13	13.6	3	86.4	19	15.8	3	84.2	16
Bligh, Reef, and Busby Islands	Shellfish	0.0	0	18.2	4	81.8	18	11.1	2	88.9	16	13.6	3	86.4	19	5.3	1	94.7	18
Boulder Bay	All Resources	0.0	0	18.2	4	81.8	18	66.7	12	33.3	6	13.6	3	86.4	19	52.6	10	47.4	9
Boulder Bay	Salmon	0.0	0	18.2	4	81.8	18	50.0	9	50.0	9	13.6	3	86.4	19	36.8	7	63.2	12
Boulder Bay	Finfish	0.0	0	18.2	4	81.8	18	16.7	3	83.3	15	13.6	3	86.4	19	5.3	1	94.7	18
Boulder Bay	Big Game	0.0	0	18.2	4	81.8	18	0.0	0	100.0	18	13.6	3	86.4	19	0.0	0	100.0	19
Boulder Bay	Marine Mammals	0.0	0	18.2	4	81.8	18	11.1	2	88.9	16	13.6	3	86.4	19	10.5	2	89.5	17
Boulder Bay	Birds	0.0	0	18.2	4	81.8	18	22.2	4	77.8	14	13.6	3	86.4	19	21.1	4	78.9	15
Boulder Bay	Shellfish	0.0	0	18.2	4	81.8	18	5.6	1	94.4	17	13.6	3	86.4	19	5.3	1	94.7	18

Table 23. Estimated Percentage of Households in Nanwalek Using Resource Harvest Areas, 1989, 1988, and Regularly Before the Exxon Valdez Oil Spill

Area Name	Salmon			Other Finfish			Shellfish			Waterfowl			Marine Mammals			Any Resource			
	Used		Reg	Used		Reg	Used		Reg	Use		Reg	Hunt	Hav	Us	ed	89	88	Reg
	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	
Any Area	88	94	97	58	88	91	82	88	88	27	39	39	42	33	48	52	97	97	97
Port Graham Bay-summary	0	9	18	15	18	21	3	6	6	9	9	12	6	3	6	6	21	30	36
Port Graham River	0	9	15	3	3	3	0	0	0	0	0	0	0	0	0	0	3	12	18
Inner Bay	0	0	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	3
Outer Bay/Coal Mine	0	0	0	12	15	15	0	0	0	0	0	0	0	0	0	0	12	15	15
Port Graham Bay-general	0	0	3	3	3	6	3	6	6	9	9	12	6	3	6	6	6	18	21
English Bay-summary	88	94	94	55	85	88	76	82	82	18	24	24	6	6	6	12	15	97	97
English Bay River	85	91	91	42	45	45	0	0	0	0	0	0	0	0	0	0	0	85	91
English Bay Reef	3	3	3	12	12	12	0	0	0	0	0	0	0	0	0	0	0	3	12
Flat Islands	3	3	3	12	24	27	3	3	3	0	0	0	0	0	0	0	0	18	30
English Bay-general	0	0	0	6	30	33	73	79	79	18	24	24	6	6	6	12	15	79	85
Koyukuk Bay/Point Addam	0	6	9	12	27	30	12	15	15	12	18	21	18	12	18	21	24	33	52
Seldovia Bay	0	0	0	0	0	0	9	12	15	6	6	0	0	0	0	0	12	15	18
Yukon Island	0	0	0	0	0	0	33	42	45	6	15	15	30	24	1	36	45	52	52
Windy/Rocky/Chugach Bays	0	3	6	0	0	0	0	0	0	0	0	0	0	0	0	3	3	0	6
Port Chatham/Elizabeth Island	6	0	0	3	6	6	0	0	0	0	0	0	0	0	0	0	0	9	6
Other Areas	0	0	0	0	0	0	6	6	6	0	0	0	0	0	0	3	3	6	9

Table 24. Area Use Patterns for Preselcted Areas, Nanwalek, 1989

Area Name	Resource	Sample Size = 33						Pre Spill						Post								
		Not Present		No Response		Total Response		Used			Response		Total Response		Used			Response		Used		
		%	N	%	N	%	N	%	N	%	%	N	%	N	%	N	%	%	N	%	N	%
Port Graham Bay	All Resources	0.0	0	3.0	1	97.0	32	62.5	20	3.0	1	97.0	32	21.9	7	78.1	25	0.0	0	100.0	32	
Port Graham Bay	Salmon	0.0	0	3.0	1	97.0	32	8.8	6	81.3	26	3.0	1	97.0	32	0.0	0	100.0	32			
Port Graham Bay	Finfish	0.0	0	3.0	1	97.0	32	21.9	7	78.1	25	3.0	1	97.0	32	15.6	5	84.4	27			
Port Graham Bay	Big Game	0.0	0	3.0	1	97.0	32	0.0	0	100.0	32	3.0	1	97.0	32	0.0	0	100.0	32			
Port Graham Bay	Marine Mammals	0.0	0	3.0	1	97.0	32	6.3	2	93.8	30	3.0	1	97.0	32	6.3	2	93.8	30			
Port Graham Bay	Birds	0.0	0	3.0	1	97.0	32	2.5	4	87.5	28	3.0	1	97.0	32	9.4	3	90.6	29			
Port Graham Bay	Shellfish	0.0	0	3.0	1	97.0	32	6.3	2	93.8	30	3.0	1	97.0	32	3.1	1	96.9	31			
English Bay	All Resources	0.0	0	3.0	1	97.0	32	100.0	32	0.0	0	3.0	1	97.0	32	100.0	32	0.0	0	100.0	32	
English Bay	Salmon	0.0	0	3.0	1	97.0	32	96.9	31	3.1	1	3.0	1	97.0	32	90.6	29	9.4	3	90.6	29	
English Bay	Finfish	0.0	0	3.0	1	97.0	32	90.6	29	9.4	3	3.0	1	97.0	32	56.3	18	43.8	14	56.3	18	
English Bay	Big Game	0.0	0	3.0	1	97.0	32	0.0	0	100.0	32	3.0	1	97.0	32	0.0	0	100.0	32			
English Bay	Marine Mammals	0.0	0	3.0	1	97.0	32	15.6	5	84.4	27	3.0	1	97.0	32	6.3	2	93.8	30			
English Bay	Birds	0.0	0	3.0	1	97.0	32	25.0	8	75.0	24	3.0	1	97.0	32	18.8	6	81.3	26			
English Bay	Shellfish	0.0	0	3.0	1	97.0	32	84.4	27	15.6	5	3.0	1	97.0	32	78.1	25	21.9	7	78.1	25	
Yukon Island	All Resources	0.0	0	3.0	1	97.0	32	53.1	17	46.9	15	3.0	1	97.0	32	46.9	15	53.1	17	46.9	15	
Yukon Island	Salmon	0.0	0	3.0	1	97.0	32	0.0	0	100.0	32	3.0	1	97.0	32	0.0	0	100.0	32			
Yukon Island	Finfish	0.0	0	3.0	1	97.0	32	0.0	0	100.0	32	3.0	1	97.0	32	0.0	0	100.0	32			
Yukon Island	Big Game	0.0	0	3.0	1	97.0	32	37.5	12	62.5	20	3.0	1	97.0	32	31.3	10	68.8	22			
Yukon Island	Marine Mammals	0.0	0	3.0	1	97.0	32	15.6	5	84.4	27	3.0	1	97.0	32	6.3	2	93.8	30			
Yukon Island	Birds	0.0	0	3.0	1	97.0	32	46.9	15	53.1	17	3.0	1	97.0	32	34.4	11	65.6	21			
Yukon Island	Shellfish	0.0	0	3.0	1	97.0	32	0.0	0	100.0	32	3.0	1	97.0	32	0.0	0	100.0	32			

Table 26. Estimated Percentage of Households in Port Graham Using Resource Harvest Areas, 1989, 1988, and Regularly Before the Exxon Valdez Oil Spill

Area Name	Salmon				Other Finfish				Shellfish				Waterfowl				Marine Mammals				Any Resource			
	Used		Used		Used		Used		Used		Used		Used		Used		Used		Used		Used		Used	
	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg
Any Area	81	88	85	60	88	85	67	98	98	33	35	35	23	17	23	40	42	90	98	98	98	98	98	98
Port Graham Bay-summary	81	88	85	58	85	83	60	96	96	31	35	35	12	6	12	27	27	90	98	98	98	98	98	98
Port Graham River	71	77	75	15	27	27	8	10	10	15	15	15	0	0	0	0	0	0	0	0	0	0	0	0
Inner Bay	15	23	21	21	23	21	21	17	17	8	4	4	0	0	0	0	0	0	0	0	0	0	0	0
Outer Bay/Coal Mine	0	0	0	19	25	25	25	7	31	2	2	2	0	0	0	0	0	2	2	35	42	42	42	42
Port Graham Bay-general	6	10	10	17	35	33	31	50	50	12	19	19	12	6	12	25	25	44	88	88	88	88	88	88
English Bay-summary	6	6	8	10	17	17	4	6	6	0	0	0	2	2	2	2	2	2	15	21	23	23	23	23
English Bay River	2	2	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
English Bay Reef	0	0	0	6	8	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
English Bay-general	4	4	6	4	8	8	4	6	6	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2
Koyukuk Bay/Point Adam	0	0	0	4	4	4	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2
Seldovia Bay	2	4	4	0	4	4	10	12	12	0	0	0	2	2	2	2	2	2	2	2	2	2	2	2
Yukon Island	0	0	0	0	0	0	17	17	15	2	4	4	15	12	15	23	23	23	23	23	23	23	23	23
Windy/Rocky/Chugach Bays	4	2	2	0	0	0	2	0	0	0	0	0	2	2	2	4	6	6	6	6	6	6	6	6
Port Chatham/Elizabeth Island	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Other Areas	4	4	4	2	2	2	2	2	2	8	8	8	2	0	0	0	0	0	0	0	0	0	0	0

Table 27. Area Use Patterns for Preselected Areas, Port Graham, 1989

Area Name	Resource	Sample Size = 48						Post Spill					
		Not Present		No Response		Total Response		Used		No Response		Total Response	
		%	N	%	N	%	N	%	N	%	N	%	N
Port Graham Bay	All Resources	0.0	0	0.0	0	100.0	48	97.9	47	2.1	1	0.0	0
Port Graham Bay	Salmon	0.0	0	0.0	0	100.0	48	87.5	42	12.5	6	0.0	0
Port Graham Bay	Flinfish	0.0	0	0.0	0	100.0	48	87.5	42	12.5	6	0.0	0
Port Graham Bay	Big Game	0.0	0	0.0	0	100.0	48	0.0	0	100.0	48	0.0	0
Port Graham Bay	Marine Mammals	0.0	0	0.0	0	100.0	48	27.1	13	72.9	35	0.0	0
Port Graham Bay	Birds	0.0	0	0.0	0	100.0	48	35.4	17	64.6	31	0.0	0
Port Graham Bay	Shellfish	0.0	0	0.0	0	100.0	48	95.8	46	4.2	2	0.0	0
English Bay	All Resources	0.0	0	0.0	0	100.0	48	22.9	11	77.1	37	0.0	0
English Bay	Salmon	0.0	0	0.0	0	100.0	48	8.3	4	91.7	44	0.0	0
English Bay	Flinfish	0.0	0	0.0	0	100.0	48	16.7	8	83.3	40	0.0	0
English Bay	Big Game	0.0	0	0.0	0	100.0	48	0.0	0	100.0	48	0.0	0
English Bay	Marine Mammals	0.0	0	0.0	0	100.0	48	2.1	1	97.9	47	0.0	0
English Bay	Birds	0.0	0	0.0	0	100.0	48	0.0	0	100.0	48	0.0	0
English Bay	Shellfish	0.0	0	0.0	0	100.0	48	6.3	3	93.8	45	0.0	0
Yukon Island	All Resources	0.0	0	0.0	0	100.0	48	29.2	14	70.8	34	0.0	0
Yukon Island	Salmon	0.0	0	0.0	0	100.0	48	0.0	0	100.0	48	0.0	0
Yukon Island	Flinfish	0.0	0	0.0	0	100.0	48	0.0	0	100.0	48	0.0	0
Yukon Island	Big Game	0.0	0	0.0	0	100.0	48	0.0	0	100.0	48	0.0	0
Yukon Island	Marine Mammals	0.0	0	0.0	0	100.0	48	22.9	11	77.1	37	0.0	0
Yukon Island	Birds	0.0	0	0.0	0	100.0	48	4.2	2	95.8	46	0.0	0
Yukon Island	Shellfish	0.0	0	0.0	0	100.0	48	16.7	8	83.3	40	0.0	0

Table 30. Area Use Patterns for Preselected Areas, Ouzinkie, 1989

		Sample Size = 35										Post Spill										
Area Name	Resource	Pre Spill					Used					Total					Used					
		Not Present		No Response		Total	Yes		No		Response		%	N	No		Yes		%	N	No	
		%	N	%	N	%	%	N	%	N	%	%	N	%	N	%	%	N	%	N	%	N
Camels Rock	All Resources	0.0	0	23.6	10	71.4	25	92.0	23	8.0	2	28.6	10	71.4	25	56.0	14	44.0	11			
Camels Rock	Salmon	0.0	0	23.6	10	71.4	25	60.0	15	40.0	10	28.6	10	71.4	25	20.0	5	80.0	20			
Camels Rock	Finfish	0.0	0	23.6	10	71.4	25	12.0	3	88.0	22	28.6	10	71.4	25	8.0	2	92.0	23			
Camels Rock	Big Game	0.0	0	23.6	10	71.4	25	32.0	8	68.0	17	28.6	10	71.4	25	12.0	3	88.0	22			
Camels Rock	Marine Mammals	0.0	0	23.6	10	71.4	25	8.0	2	92.0	23	28.6	10	71.4	25	0.0	0	100.0	25			
Camels Rock	Birds	0.0	0	23.6	10	71.4	25	48.0	12	52.0	13	28.6	10	71.4	25	40.0	10	60.0	15			
Camels Rock	Shellfish	0.0	0	23.6	10	71.4	25	48.0	12	52.0	13	28.6	10	71.4	25	16.0	4	84.0	21			
Proocoda Island, Cat Island	All Resources	0.0	0	23.6	10	71.4	25	28.0	7	72.0	18	28.6	10	71.4	25	16.0	4	84.0	21			
Proocoda Island, Cat Island	Salmon	0.0	0	23.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Proocoda Island, Cat Island	Finfish	0.0	0	23.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Proocoda Island, Cat Island	Big Game	0.0	0	23.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Proocoda Island, Cat Island	Marine Mammals	0.0	0	23.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Proocoda Island, Cat Island	Birds	0.0	0	23.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Proocoda Island, Cat Island	Shellfish	0.0	0	23.6	10	71.4	25	28.0	7	72.0	18	28.6	10	71.4	25	16.0	4	84.0	21			
Sourdough Flats	All Resources	0.0	0	28.6	10	71.4	25	40.0	10	60.0	15	28.6	10	71.4	25	20.0	5	80.0	20			
Sourdough Flats	Salmon	0.0	0	28.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Sourdough Flats	Finfish	0.0	0	28.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Sourdough Flats	Big Game	0.0	0	28.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Sourdough Flats	Marine Mammals	0.0	0	28.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Sourdough Flats	Birds	0.0	0	28.6	10	71.4	25	0.0	0	100.0	25	28.6	10	71.4	25	0.0	0	100.0	25			
Sourdough Flats	Shellfish	0.0	0	28.6	10	71.4	25	40.0	10	60.0	15	28.6	10	71.4	25	20.0	5	80.0	20			

Table 33. Area Use Patterns for Preselected Areas, Larsen Bay, 1989

Area Name	Resource	Pre Spill						Post Spill							
		Not Present		No Response		Total		Used		Response		Total		Used	
		%	N	%	N	%	N	%	N	%	N	%	N	%	N
Chief Point (Bird Rock)	All Resources	0.0	0	29.4	10	70.6	24	25.0	6	75.0	18	29.4	10	70.6	24
Chief Point (Bird Rock)	Salmon	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Chief Point (Bird Rock)	Firfish	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Chief Point (Bird Rock)	Big Game	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Chief Point (Bird Rock)	Marine Mammals	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Chief Point (Bird Rock)	Birds	0.0	0	29.4	10	70.6	24	25.0	6	75.0	18	29.4	10	70.6	24
Chief Point (Bird Rock)	Shellfish	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Larsen Bay Channel	All Resources	0.0	0	29.4	10	70.6	24	83.3	20	16.7	4	29.4	10	70.6	24
Larsen Bay Channel	Salmon	0.0	0	29.4	10	70.6	24	29.2	7	70.8	17	29.4	10	70.6	24
Larsen Bay Channel	Firfish	0.0	0	29.4	10	70.6	24	37.5	9	62.5	15	29.4	10	70.6	24
Larsen Bay Channel	Big Game	0.0	0	29.4	10	70.6	24	16.7	4	83.3	20	29.4	10	70.6	24
Larsen Bay Channel	Marine Mammals	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Larsen Bay Channel	Birds	0.0	0	29.4	10	70.6	24	12.5	3	87.5	21	29.4	10	70.6	24
Larsen Bay Channel	Shellfish	0.0	0	29.4	10	70.6	24	66.7	16	33.3	8	29.4	10	70.6	24
Spiridon Bay	All Resources	0.0	0	29.4	10	70.6	24	8.3	2	91.7	22	29.4	10	70.6	24
Spiridon Bay	Salmon	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Spiridon Bay	Firfish	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Spiridon Bay	Big Game	0.0	0	29.4	10	70.6	24	4.2	1	95.8	23	29.4	10	70.6	24
Spiridon Bay	Marine Mammals	0.0	0	29.4	10	70.6	24	0.0	0	100.0	24	29.4	10	70.6	24
Spiridon Bay	Birds	0.0	0	29.4	10	70.6	24	4.2	1	95.8	23	29.4	10	70.6	24
Spiridon Bay	Shellfish	0.0	0	29.4	10	70.6	24	nn	nn	100.0	24	29.4	10	70.6	24

Table 35. Estimated Percentage of Households in Karluk Using Resource Harvest Areas, 1989, 1988, and Regularly Before the Exxon Valdez Oil Spill

Area Name	Salmon			Finfish			Shellfowl			Deer			Marine Mammal			Any Resource		
	Used		Used	Used		Used	Used		Used	Hunt	Havr	Used	Hunt	Havr	Used	Hunt	Havr	Used
	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg
Any Area	79	71	79	71	79	86	79	64	79	57	50	57	71	71	86	21	21	29
Halibut Bay	0	0	0	0	0	0	7	7	21	0	0	0	0	0	0	0	7	7
Uyak Bay-summary	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	7
Uyak Bay-general	0	0	0	0	0	0	7	7	0	0	0	0	0	0	0	0	0	7
Karluk River (including portage)	14	14	0	0	0	0	0	0	0	7	7	0	0	0	0	0	0	14
Karluk Village Area	79	71	79	71	79	86	64	50	57	50	57	71	71	86	7	7	7	86
Larsen Bay	0	0	0	0	0	0	21	21	29	0	0	0	0	0	0	0	0	21
Larsen Bay-general	0	0	0	0	0	0	21	21	29	0	0	0	0	0	0	0	0	21
Outer Uyak	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0	0
Shelikof	0	0	0	21	21	0	0	0	7	7	0	0	0	0	7	7	7	21
Sturgeon Head	0	0	0	0	0	0	0	0	7	0	0	0	0	0	0	0	0	0
Sturgeon River	0	0	0	21	21	29	14	7	14	0	0	0	0	0	7	7	14	36

Table 36. Area Use Patterns for Preslected Areas, Karluk, 1989

		Sample Size = 14										Post Spill									
Area Name	Resource	Pre Spill										Used									
		Not Present		No Response		Total Response		Used		Response		Total Response		Yes		Used		No			
		%	N	%	N	%	N	%	N	%	N	%	%	N	%	N	%	N	%	N	
Halibut Bay	All Resources	0.0	0	7.1	1	92.9	13	23.1	3	76.9	10	7.1	1	92.9	13	7.7	1	92.3	12		
Halibut Bay	Salmon	0.0	0	7.1	1	92.9	13	0.0	0	100.0	13	7.1	1	92.9	13	0.0	0	100.0	13		
Halibut Bay	Finfish	0.0	0	7.1	1	92.9	13	0.0	0	100.0	13	7.1	1	92.9	13	0.0	0	100.0	13		
Halibut Bay	Big Game	0.0	0	7.1	1	92.9	13	0.0	0	100.0	13	7.1	1	92.9	13	0.0	0	100.0	13		
Halibut Bay	Marine Mammals	0.0	0	7.1	1	92.9	13	7.7	1	92.3	12	7.1	1	92.9	13	0.0	0	100.0	13		
Halibut Bay	Birds	0.0	0	7.1	1	92.9	13	0.0	0	100.0	13	7.1	1	92.9	13	0.0	0	100.0	13		
Halibut Bay	Shellfish	0.0	0	7.1	1	92.9	13	23.1	3	76.9	10	7.1	1	92.9	13	7.7	1	92.3	12		
Karluk Village Area	All Resources	0.0	0	7.1	1	92.9	13	100.0	13	0.0	0	7.1	1	92.9	13	92.3	12	7.7	1		
Karluk Village Area	Salmon	0.0	0	7.1	1	92.9	13	84.6	11	15.4	2	7.1	1	92.9	13	84.6	11	15.4	2		
Karluk Village Area	Finfish	0.0	0	7.1	1	92.9	13	92.3	12	7.7	1	7.1	1	92.9	13	76.9	10	23.1	3		
Karluk Village Area	Big Game	0.0	0	7.1	1	92.9	13	92.3	12	7.7	1	7.1	1	92.9	13	76.9	10	23.1	3		
Karluk Village Area	Marine Mammals	0.0	0	7.1	1	92.9	13	7.7	1	92.3	12	7.1	1	92.9	13	7.7	1	92.3	12		
Karluk Village Area	Birds	0.0	0	7.1	1	92.9	13	61.5	8	38.5	5	7.1	1	92.9	13	61.5	8	38.5	5		
Karluk Village Area	Shellfish	0.0	0	7.1	1	92.9	13	61.5	8	38.5	5	7.1	1	92.9	13	69.2	9	30.8	4		
Sturgeon River	All Resources	0.0	0	7.1	1	92.9	13	46.2	6	53.8	7	7.1	1	92.9	13	38.5	5	61.5	8		
Sturgeon River	Salmon	0.0	0	7.1	1	92.9	13	0.0	0	100.0	13	7.1	1	92.9	13	0.0	0	100.0	13		
Sturgeon River	Finfish	0.0	0	7.1	1	92.9	13	0.0	0	100.0	13	7.1	1	92.9	13	0.0	0	100.0	13		
Sturgeon River	Big Game	0.0	0	7.1	1	92.9	13	0.0	0	100.0	13	7.1	1	92.9	13	0.0	0	100.0	13		
Sturgeon River	Marine Mammals	0.0	0	7.1	1	92.9	13	15.4	2	84.6	11	7.1	1	92.9	13	7.7	1	92.3	12		
Sturgeon River	Birds	0.0	0	7.1	1	92.9	13	15.4	2	84.6	11	7.1	1	92.9	13	15.4	2	84.6	11		
Sturgeon River	Shellfish	0.0	0	7.1	1	92.9	13	30.8	4	69.2	9	7.1	1	92.9	13	23.1	3	76.9	10		

Table 37. Area Use Patterns for Preselected Areas, Karluk, 1990

Area Name	Resource	Pre Spill						Post Spill					
		Not Present		No Response		Total Response		Used		No Response		Total Response	
		%	N	%	N	%	N	%	N	%	N	%	N
Halibut Bay	All Resources	0.0	0	5.9	1	94.1	16	56.3	9	43.8	7	5.9	1
Halibut Bay	Salmon	0.0	0	5.9	1	94.1	16	0.0	0	100.0	6	5.9	1
Halibut Bay	Finfish	0.0	0	5.9	1	94.1	16	0.0	0	100.0	6	5.9	1
Halibut Bay	Big Game	0.0	0	5.9	1	94.1	16	50.0	8	50.0	8	5.9	1
Halibut Bay	Furbearers	0.0	0	5.9	1	94.1	16	0.0	0	100.0	6	5.9	1
Halibut Bay	Marine Mammals	0.0	0	5.9	1	94.1	16	12.5	2	87.5	4	5.9	1
Halibut Bay	Birds	0.0	0	5.9	1	94.1	16	37.5	6	62.5	0	5.9	1
Halibut Bay	Shellfish	0.0	0	5.9	1	94.1	16	31.3	5	68.8	1	5.9	1
Halibut Bay	Plants	0.0	0	5.9	1	94.1	16	25.0	4	75.0	12	5.9	1
Halibut Bay	...	~	~	~	~	~	~	0.0	0	100.0	16	5.9	1
Karluk Village Area	All Resources	0.0	0	5.9	1	94.1	16	93.8	15	6.3	11	5.9	1
Karluk Village Area	Salmon	0.0	0	5.9	1	94.1	16	93.8	15	6.3	11	5.9	1
Karluk Village Area	Finfish	0.0	0	5.9	1	94.1	16	62.5	10	37.5	6	5.9	1
Karluk Village Area	Big Game	0.0	0	5.9	1	94.1	16	75.0	12	25.0	4	5.9	1
Karluk Village Area	Furbearers	0.0	0	5.9	1	94.1	16	25.0	4	75.0	12	5.9	1
Karluk Village Area	Marine Mammals	0.0	0	5.9	1	94.1	16	43.8	7	56.3	9	5.9	1
Karluk Village Area	Birds	0.0	0	5.9	1	94.1	16	75.0	12	25.0	4	5.9	1
Karluk Village Area	Shellfish	0.0	0	5.9	1	94.1	16	56.3	9	43.8	7	5.9	1
Karluk Village Area	Plants	0.0	0	5.9	1	94.1	16	87.5	14	12.5	2	5.9	1
Karluk Village Area	... ¹²	~	~	~	~	~	~	0.0	0	100.0	16	5.9	1
Sturgeon River	All Resources	0.0	0	5.9	1	94.1	16	93.8	15	6.3	1	94.1	16
Sturgeon River	Salmon	0.0	0	5.9	1	94.1	16	0.0	0	100.0	16	5.9	1
Sturgeon River	Finfish	0.0	0	5.9	1	94.1	16	6.3	1	93.8	15	5.9	1
Sturgeon River	Big Game	0.0	0	5.9	1	94.1	16	75.0	12	25.0	4	5.9	1
Sturgeon River	Furbearers	0.0	0	5.9	1	94.1	16	12.5	2	87.5	14	5.9	1
Sturgeon River	Marine Mammals	0.0	0	5.9	1	94.1	16	43.8	7	56.3	9	5.9	1
Sturgeon River	Birds	0.0	0	5.9	1	94.1	16	37.5	6	62.5	10	5.9	1
Sturgeon River	Shellfish	0.0	0	5.9	1	94.1	16	43.8	7	56.3	9	5.9	1
Sturgeon River	Plants	0.0	0	5.9	1	94.1	16	81.3	13	18.8	3	5.9	1
Sturgeon River	... ¹²	~	~	~	~	~	~	~	~	~	~	5.9	1

Table 39. Estimated Percentage of Households in Akiok Using Resource Harvest Areas, 1989, 1988, and Regularly Before the Exxon Valdez Oil Spill

Area Name	Salmon			Finfish			Shellfish			Waterfowl			Deer			Marine Mammals			Any Resource								
	Used	Used	Reg	89	88	Reg	Used	Used	Reg	89	88	Reg	Hunt	Hunt	Harv	Used	Hunt	Hunt	Harv	Used	89	88	Reg	89	88	Req	
Any Area	70	80	90	70	70	70	100	100	100	80	80	80	70	70	70	80	60	60	60	60	100	100	100	100	100	100	
Akiok/Lagoon/Little Narrows	0	0	0	0	0	0	100	100	100	80	80	80	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Alitak Bay (Halibut)	0	0	0	50	50	50	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aliulik Peninsula/Old Village	0	0	0	0	0	0	0	0	0	0	0	0	0	10	10	10	10	0	0	0	0	0	0	0	0	0	0
Cape Hepburn/Salua Bay/Portage Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	20	0	20	20	10	10	10	10	20	20	20	20	20	20
Deadman Bay	0	0	10	10	10	10	0	0	10	10	10	10	70	50	70	60	50	50	50	50	40	40	70	70	70	70	
Dog Salmon/Horse Marine Creek	40	40	40	40	40	40	30	30	30	0	0	0	60	50	50	50	40	40	40	40	40	40	70	70	70	70	
Kaguyak/Jap Bays/Two Headed Islands	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Kempff Bay/Sukhoi Lagoon	30	40	40	0	0	0	30	30	30	20	20	20	0	20	20	0	0	0	0	0	0	0	0	0	0	0	0
Lazy Bay/Tanner Head	0	0	0	40	40	40	50	50	50	10	10	10	40	10	40	40	50	0	0	0	0	0	0	60	60	70	
Moser Bay/Fossil Point/Bun Point	50	60	70	10	10	10	20	20	20	40	40	40	10	10	10	10	0	0	0	0	0	0	70	80	90		
Akalura Creek/Silver Salmon Lake	30	30	30	10	10	10	0	0	0	0	0	0	10	10	10	10	20	0	0	0	0	0	0	40	40	50	
Olga Lakes	10	10	0	0	0	0	0	0	0	0	0	0	10	0	10	0	10	0	10	10	10	20	20	10			
Upper Station/Upper Olga Lake	30	20	20	10	10	10	0	0	10	10	10	40	20	40	40	50	30	10	30	30	30	30	50	50	50	60	

Table 41. Percentage of Households in Chignik Bay Using Alaska Peninsula Areas in 1989, 1988 and Regularity

Area Name	Salmon Used			Finfish Used			Shellfish Used			Waterfowl Used			Marine Mammals Used			Any Resource Used			
	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	
Any Area	66	63	60	69	57	63	80	71	71	49	46	43	20	20	17	17	89	80	80
Area Unknown	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0	6	0	0	
Chignik Bay	23	29	29	60	49	51	63	57	57	37	31	31	17	17	11	11	77	69	69
Chignik Lagoon	40	40	40	17	17	23	17	14	14	17	14	17	3	3	3	3	54	51	51
Chignik Lake	14	17	14	0	0	0	3	0	0	0	0	0	0	0	0	0	17	17	17
Black Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Castle Bay	0	0	0	6	3	3	3	6	3	0	0	0	0	0	0	0	0	0	0
Kujilik Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Aniakchak/Amber Bay	0	0	0	0	0	0	3	3	3	0	3	0	0	0	0	3	6	0	3
Yantarni Bay and East	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Mitrofania Bay	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Perryville/Anchor Bay	0	0	0	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0
Ivanof Bay	0	0	0	0	3	3	0	0	3	3	3	3	0	0	0	3	3	3	3
Kenai Peninsula	3	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Lake Bay	0	0	0	0	0	0	0	0	0	2	2	2	2	2	2	2	2	2	2

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1990

Table 42. Percentage of Households in Chignik Lagoon Using Alaska Peninsula Areas in 1989, 1988 and Regularity

Area Name	Salmon			Finfish			Shellfish			Waterfowl			Marine Mammals			Any Resource Used		
	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg	89	88	Reg
Any Area	53	67	73	47	40	40	47	47	47	33	33	33	7	7	7	7	6	73
Chignik Bay	0	0	0	27	27	20	20	27	27	27	0	0	0	0	0	0	4	47
Chignik Lagoon	47	60	67	27	33	27	40	47	47	33	33	33	7	7	7	7	6	73
Chignik Lake	20	20	27	0	0	0	0	0	0	13	13	13	0	0	0	0	0	27
Black Lake	0	0	0	0	0	0	0	0	0	7	7	7	0	0	0	0	0	7
Castle Bay	0	0	0	7	0	7	0	0	0	0	0	0	0	0	0	0	0	0
Kujukik Bay	0	0	7	0	0	0	0	0	0	0	7	7	0	0	0	0	0	7
Aniakchak/Amber Bay	0	0	7	0	0	0	0	7	7	0	0	7	0	0	0	0	0	7
Yantami Bay and East Ilivik/ Seal Islands	0	0	7	0	0	0	0	7	7	0	0	7	0	0	0	0	0	7
Dorner Bay (Kuiukta Bay)	0	0	0	0	0	0	13	13	13	13	7	13	0	0	0	0	0	20
Humpback Bay/ Kuprehoff Harbor	0	0	0	7	0	0	13	13	13	0	0	0	0	0	0	0	2	13
Ivanof Bay	0	0	0	0	0	0	7	13	13	0	0	0	0	0	0	0	0	13

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1990

Table 43. Percentage of Households in Chignik Lake Using Alaska Peninsula Areas in 1989, 1988 and Regularly

Area Name	Salmon			Finfish			Shellfish			Waterfowl			Marine			Mammals			Any Resource		
	89 Used	88 Reg	89 Used	88 Reg																	
Any Area	81	81	48	43	43	43	52	52	62	62	62	62	38	29	38	38	33	81	81	81	
Area Unknown	0	0	5	0	5	0	0	0	0	0	0	0	5	0	5	0	0	10	0	0	
Chignik Bay	5	5	24	19	19	24	33	33	10	10	10	10	5	5	5	29	5	38	38	38	
Chignik Lagoon	52	57	19	24	24	19	33	24	48	48	48	48	29	24	10	33	29	76	81	81	
Chignik Lake	76	76	5	5	5	0	0	0	43	43	43	43	10	10	0	14	99	76	76	76	
Black Lake	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	14	14	14	
Kujulik Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Yantarni Bay and East Ilivik/ Seal Islands	0	0	0	0	0	0	5	5	5	0	0	0	0	0	0	0	0	0	5	5	
Dorner Bay (Kuiukka Bay)	0	0	0	0	0	0	0	0	19	19	19	19	14	0	0	0	0	0	19	19	
Perryville/Anchor Bay	0	0	0	0	0	0	10	10	0	0	0	0	0	0	0	0	0	10	10	10	
Humpback Bay /Kuprehoff Harbor	0	0	0	0	0	0	5	10	10	0	0	0	0	0	0	0	0	5	10	10	
Ivanof Bay	0	0	0	0	5	5	10	14	0	0	0	0	0	0	0	0	0	10	14	14	

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1990

Table 44. Percentage of Households in Ivanof Bay Using Alaska Peninsula Areas in 1989, 1988 and Regularly

Area Name	Salmon			Finfish			Shellfish			Waterfowl			Marine Mammals			Any Resource		
	89	Used	Reg	89	Used	Reg	89	Used	Reg	89	Used	Reg	89	Used	Reg	89	Used	Reg
Any Area	100	100	100	100	71	71	100	100	100	86	86	86	71	57	71	86	100	100
Area Unknown	0	0	0	29	0	0	0	0	0	14	0	0	0	0	0	29	0	0
Chignik Bay	0	0	0	14	14	14	14	14	14	0	0	0	0	0	0	0	14	14
Chignik Lagoon	29	29	29	29	29	29	0	0	0	0	0	0	0	0	0	0	29	29
Mitofaria Bay	0	0	0	0	0	0	0	0	0	29	29	29	0	0	0	0	29	29
Perryville/Anchor Bay	0	14	14	43	43	0	14	14	14	29	29	29	14	0	14	14	43	57
Humpback Bay/ Kuprehoff Harbor	0	14	43	43	43	57	43	29	29	29	29	29	14	29	29	71	86	86
Ivanof Bay	86	71	86	57	43	43	100	100	100	86	86	86	71	57	71	86	100	100

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1990

Table 45. Percentage of Households in Perryville Using Alaska Peninsula Areas in 1989, 1988 and Regularly

Area Name	Salmon			Finfish			Shellfish			Waterfowl			Hunt			Marine Mammals			Any Resource Used		
	89 Used	88 Reg	89 Used	88 Reg	89 Used	88 Reg															
Any Area	81	81	78	78	70	67	89	89	85	44	41	41	41	30	41	33	37	96	96	93	
Area Unknown	0	0	0	0	7	0	0	0	0	0	0	0	4	4	4	0	0	11	0	0	
Chignik Bay	4	4	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	
Chignik Lagoon	30	22	26	7	7	7	0	0	0	0	0	0	0	7	7	7	4	4	30	22	
Chignik Lake	11	15	11	0	0	0	0	0	0	0	4	7	0	0	0	0	0	11	15	11	
Dorner Bay (Kuiukta Bay)	0	0	0	0	0	0	0	0	0	0	0	0	0	4	4	4	0	4	0	4	
Mitrofania Bay	11	7	7	0	4	4	7	11	11	0	0	4	11	7	11	7	11	22	22	26	
Anchor Bay	7	7	7	0	0	0	4	4	4	0	0	0	0	0	0	0	0	11	11	11	
Mitrofania Bay-general	0	0	0	0	4	4	4	7	7	0	0	4	11	7	11	7	11	15	15	19	
Perryville/Anchor Bay	78	78	74	70	70	67	81	81	74	37	33	41	30	19	30	30	33	96	96	93	
Humpback Bay/	11	7	11	0	0	19	22	26	4	4	7	4	0	4	7	15	22	30	41	37	
Ivanof Bay	0	0	0	0	0	0	26	30	30	7	7	7	11	4	11	11	15	33	37	37	
East Stepovak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	4	
Stepovak Flats	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Northwest Stepovak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	
Southwest Stepovak	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	
Balboa Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	
Beaver Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	
Payoff Bay	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	4	0	0	

Source: Alaska Department of Fish and Game, Division of Subsistence, Household Survey, 1990

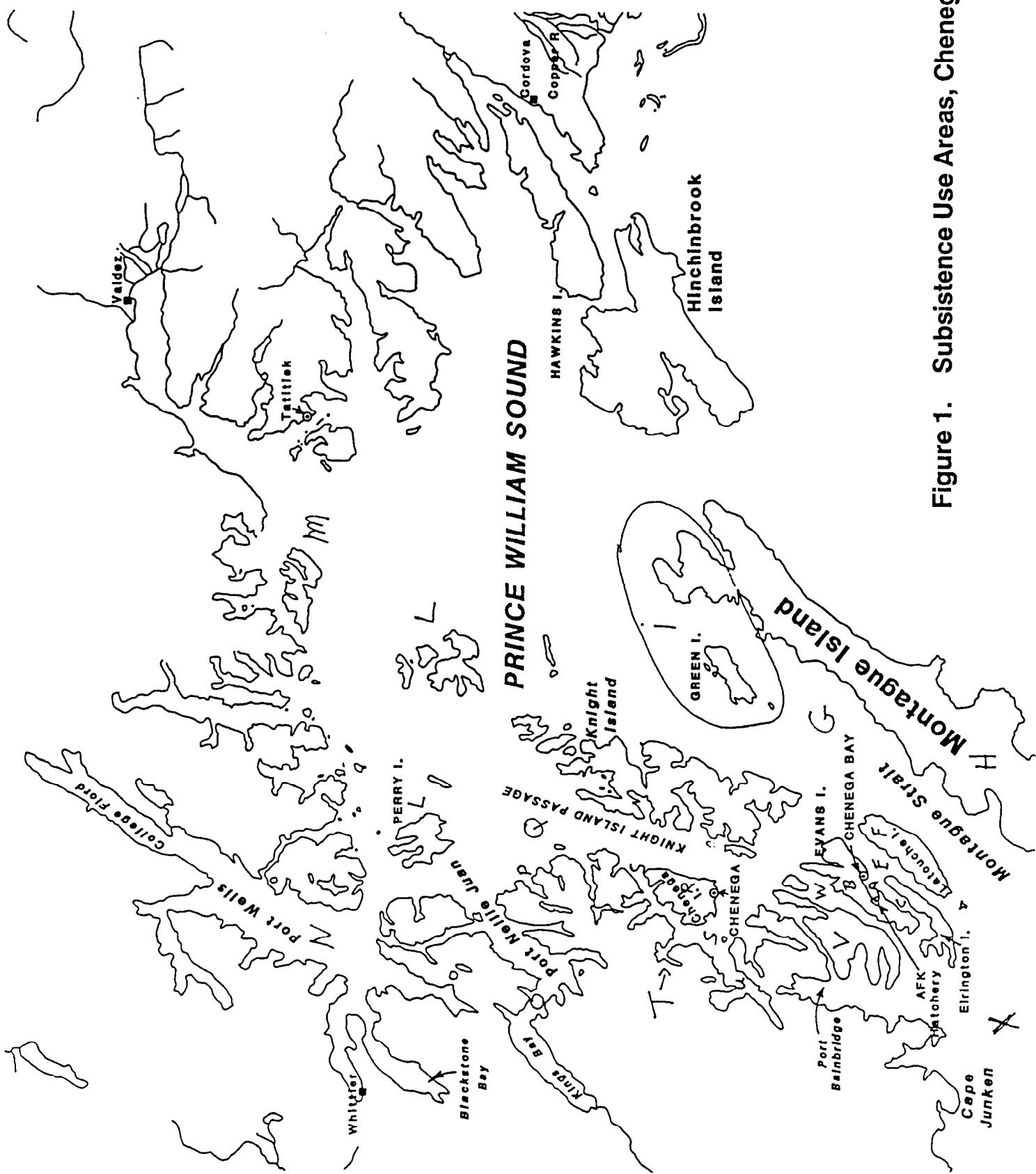


Figure 1. Subsistence Use Areas, Chenega Bay

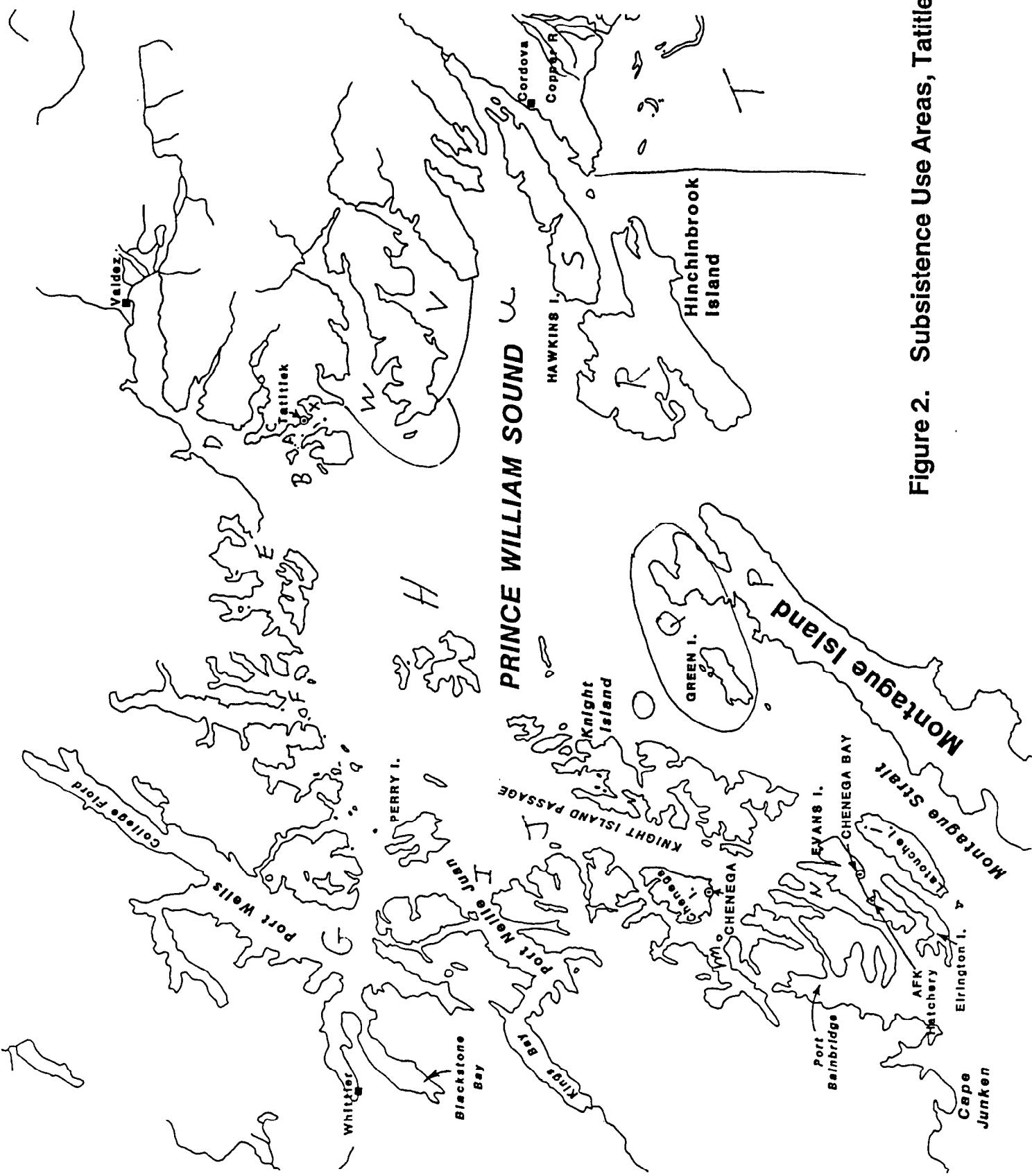


Figure 2. Subsistence Use Areas, Tatitlek

Geographic Name List for 1989 Household Survey

- A = Port Graham Bay
- B = English Bay
- C = Koyuktulik Bay
- D = Seldovia Bay
- E = Yukon Island
- F = Windy Bay
- G = Port Chatham
- H = Other Area(s)

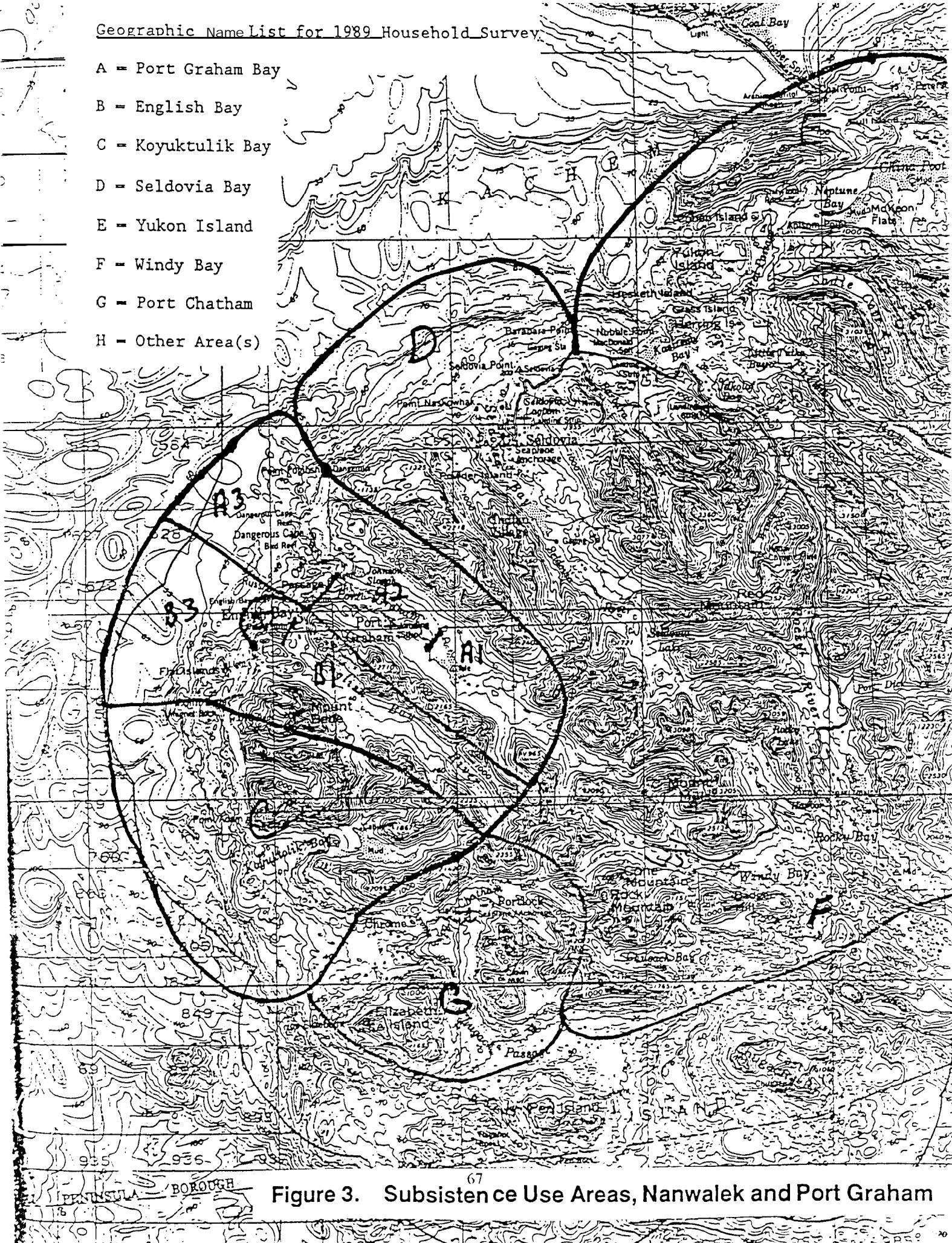
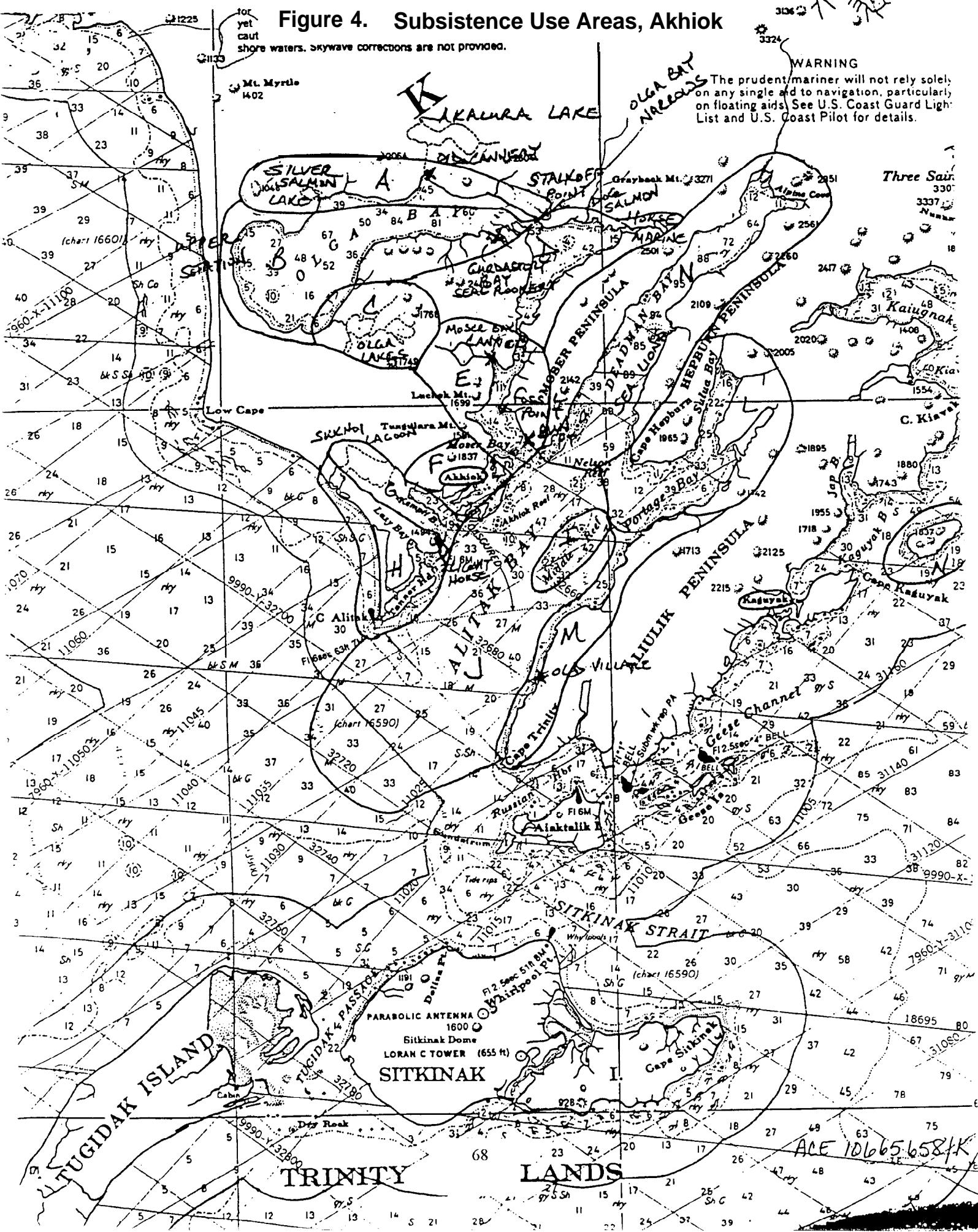


Figure 3. Subsistence Use Areas, Nanwalek and Port Graham

Figure 4. Subsistence Use Areas, Akhiok



LARSEN BAY USE AREAS

Figure 5. Subsistence Use Areas, Larsen Bay and Karluk

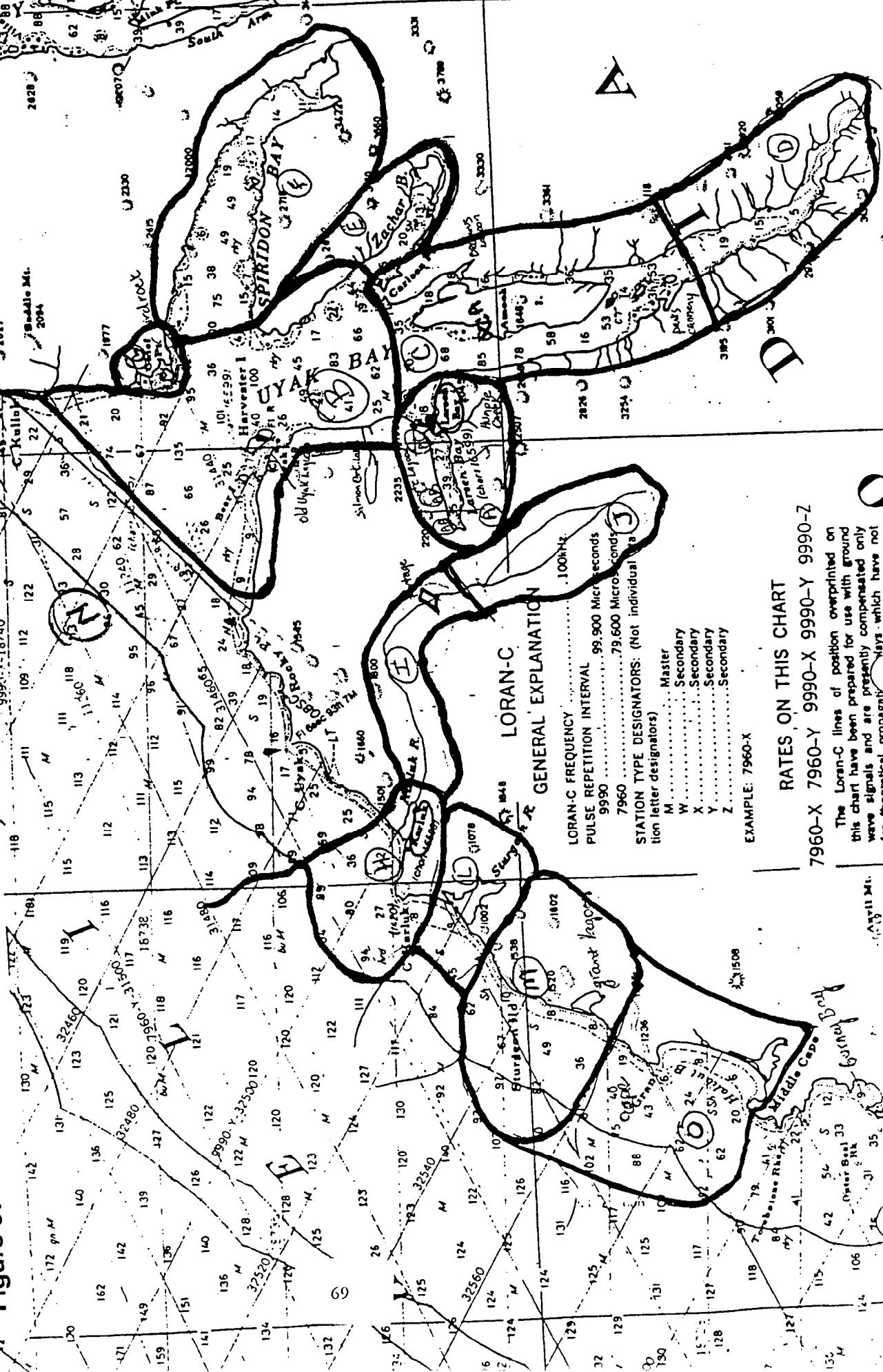


Figure 6. Subsistence Use Areas, Old Harbor

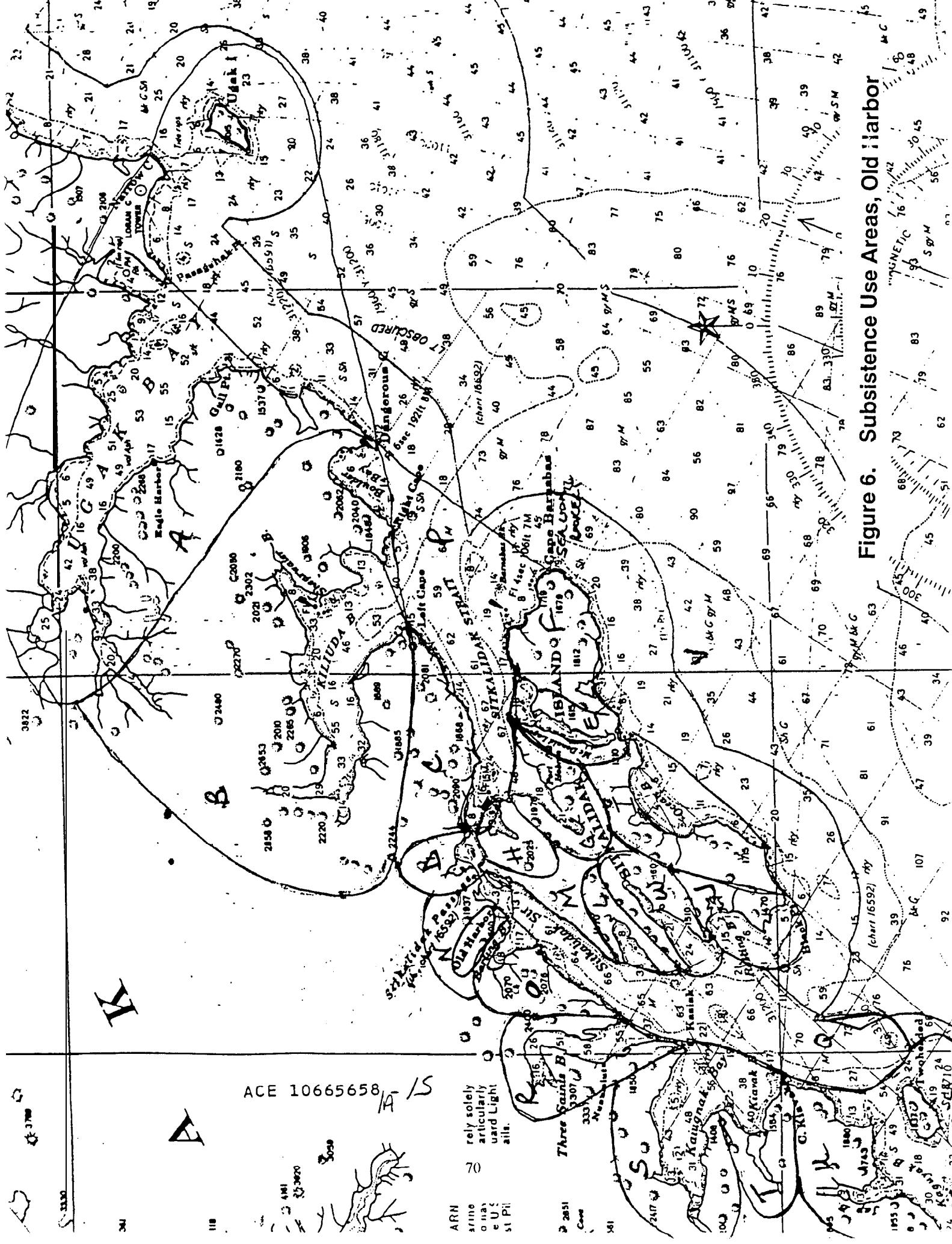


Figure 7. Subsistence Use Areas, Ouzinkie, Part 1

Ouzinkie

Subsistence Use Areas

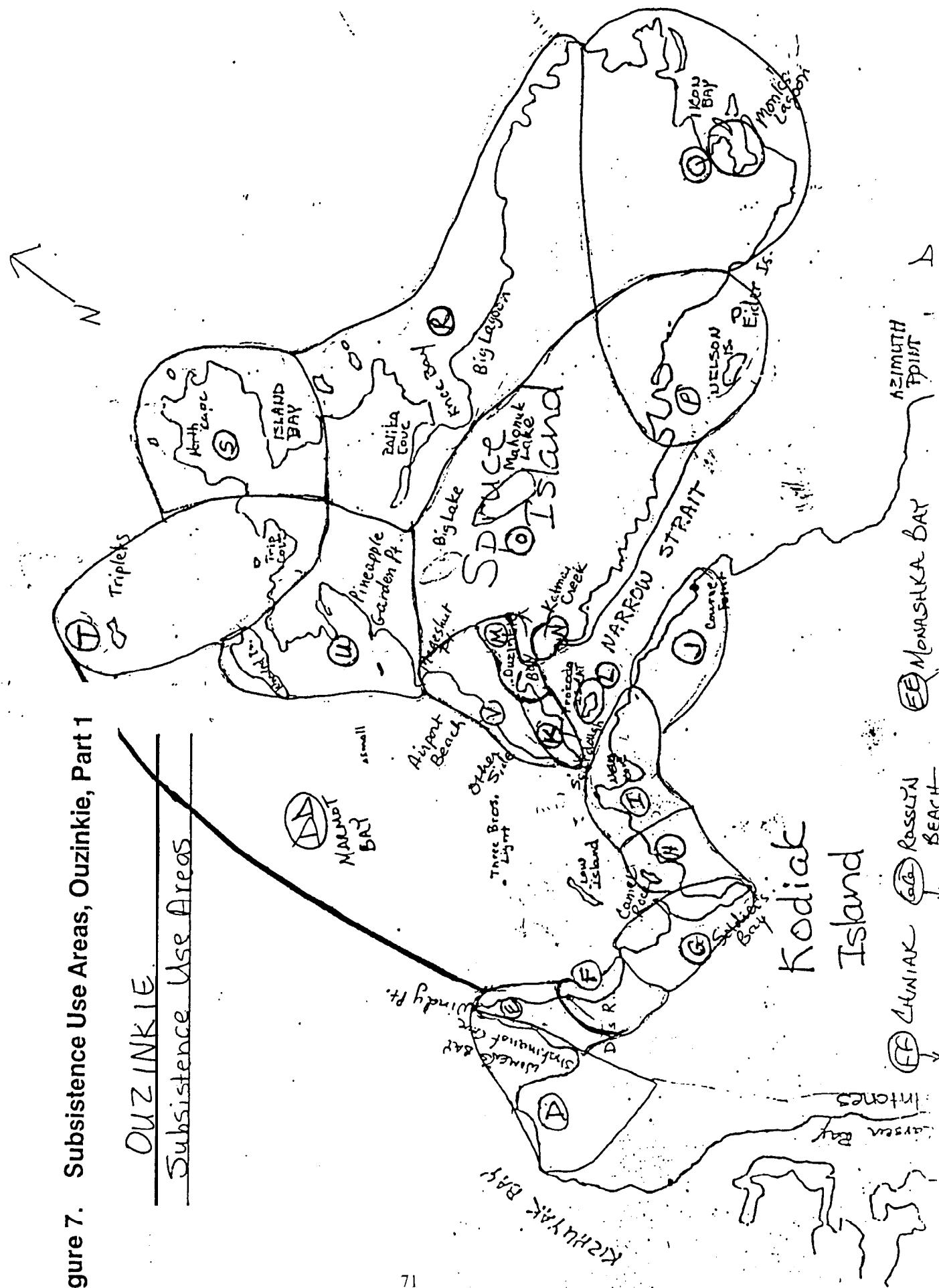


Figure 8. Subsistence Use Areas, Ouzinkie, Part 2

PROHIBITED AREA
Womens Bay
Boundaries are published in Chapter 1

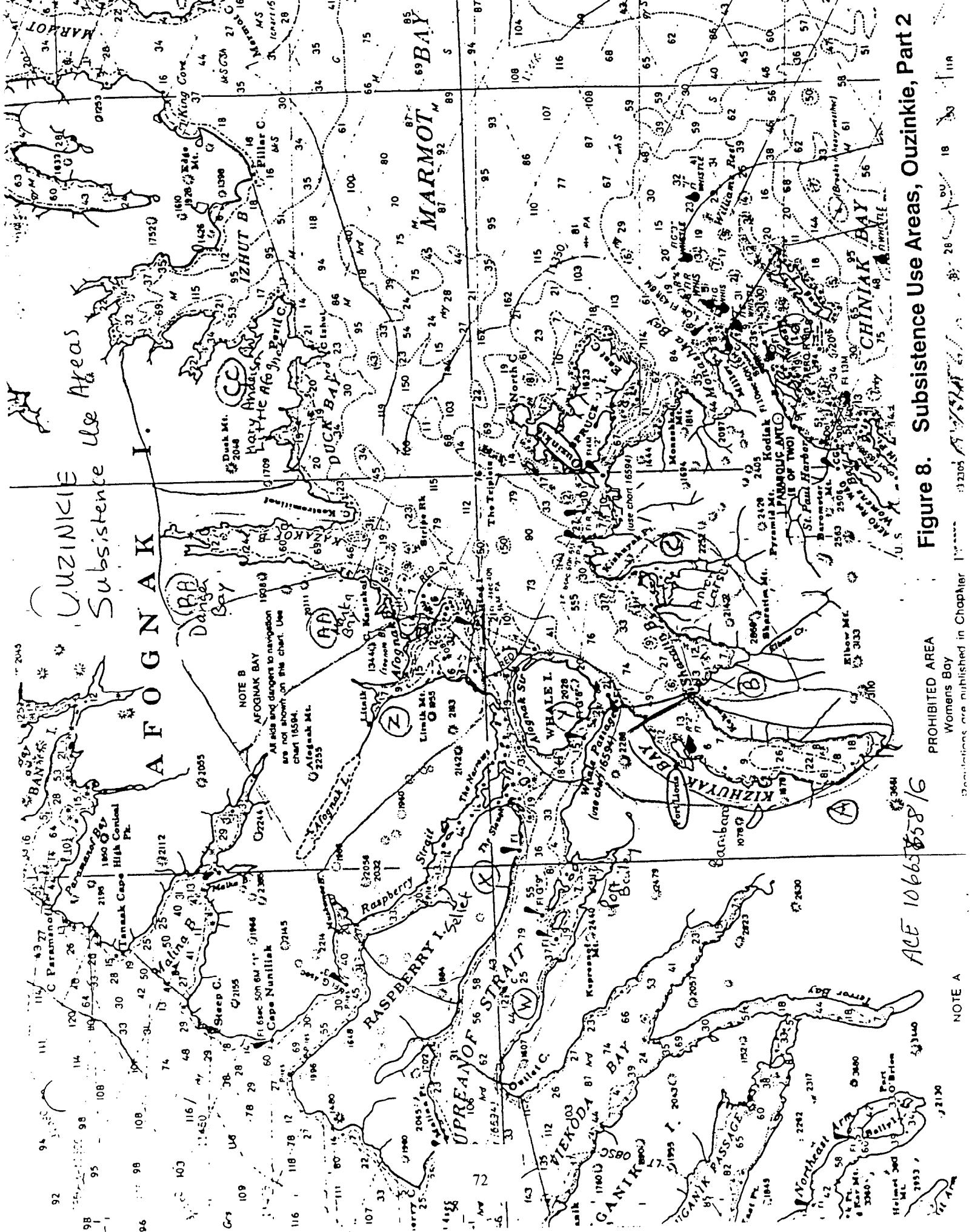
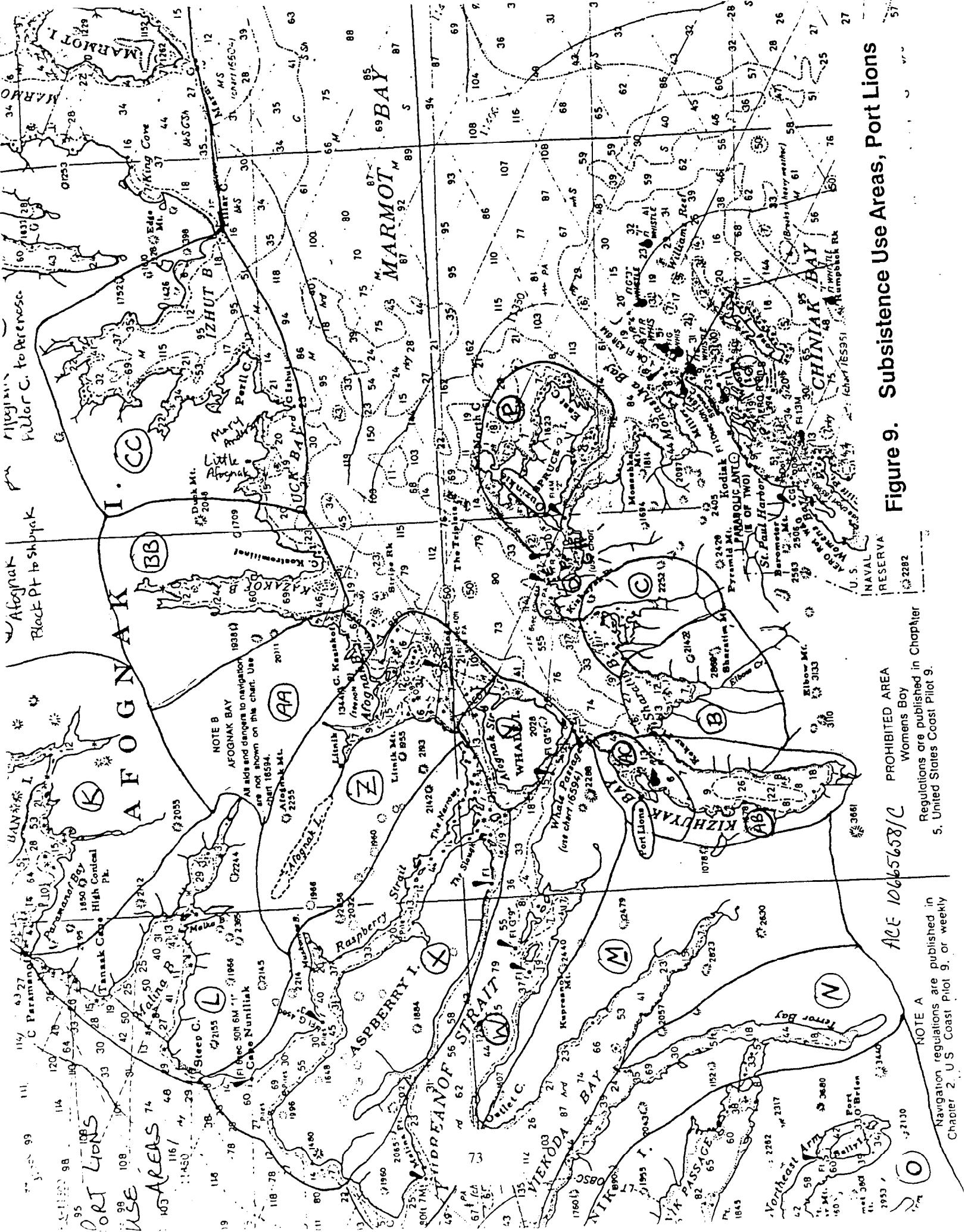


Figure 9. Subsistence Use Areas, Port Lions

NOTE B
AFOGNAK BAY
All areas and dangers to navigation
are not shown on this chart. Use
Chart 1838.

NOTE C
Womens Bay
Regulations are published in Chapter
5, United States Coast Pilot 9.

NOTE A
Navigation regulations are published in
Chapter 2, U.S. Coast Pilot 9, or weekly



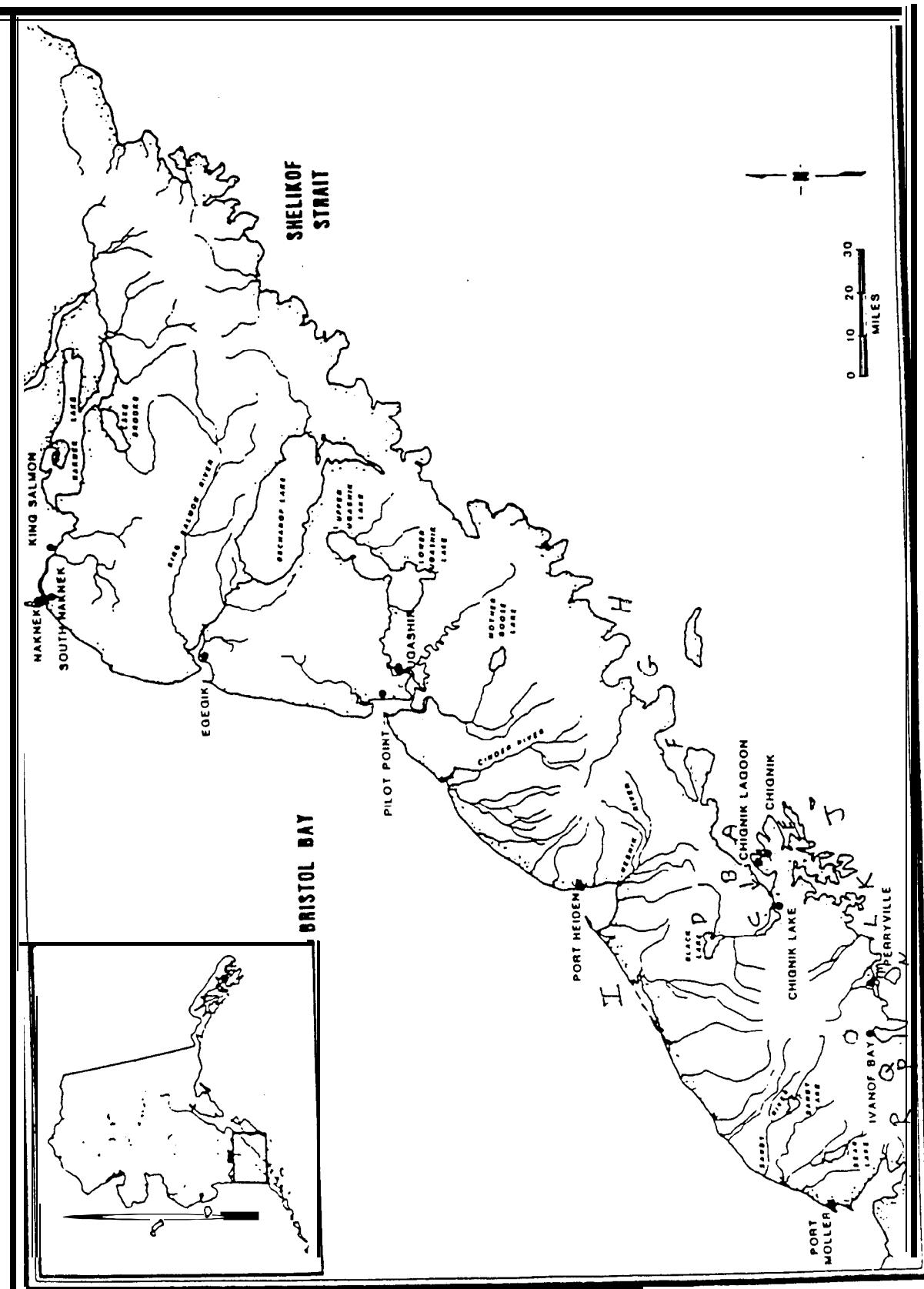
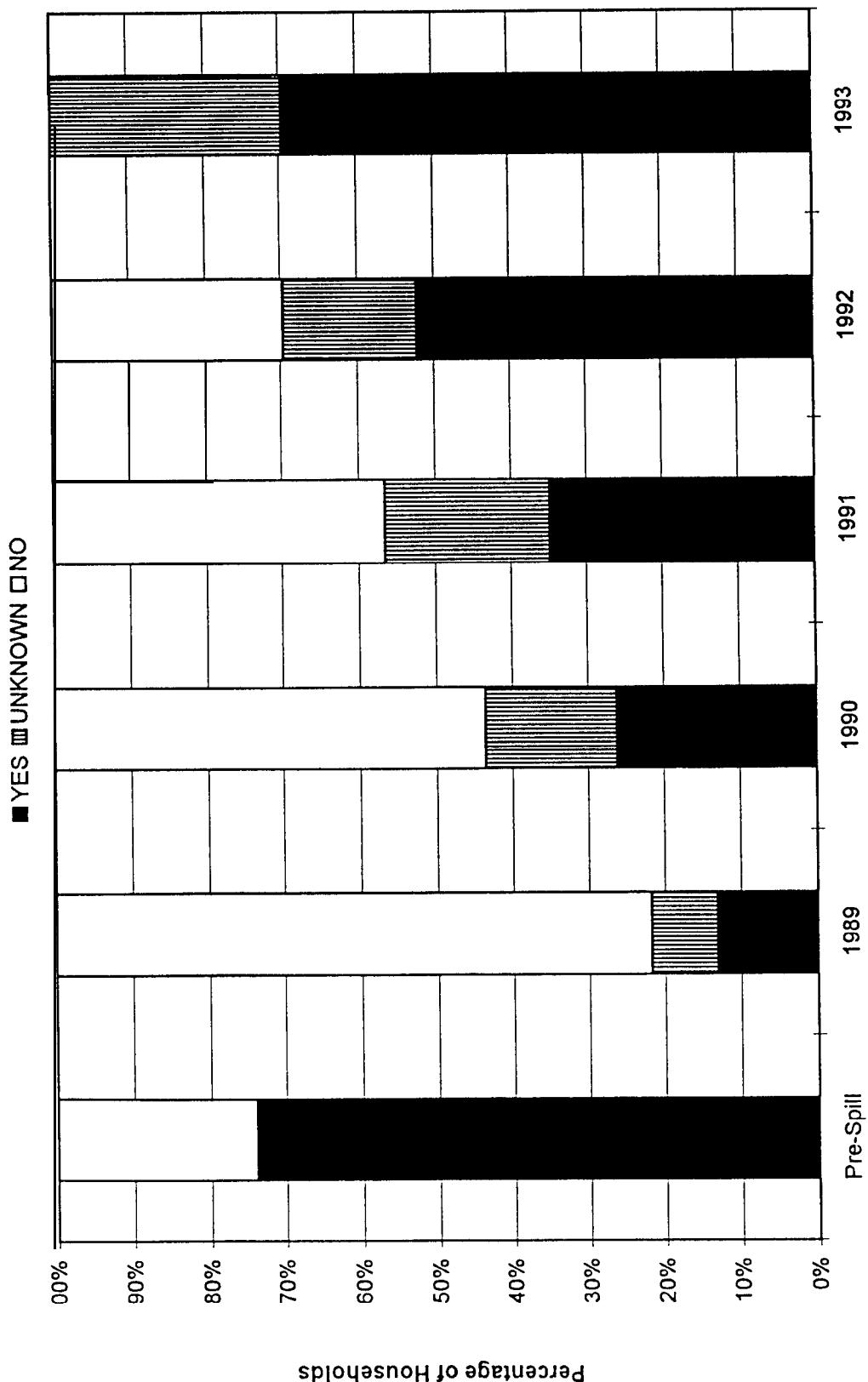


Figure 10. Subsistence Use Areas, Alaska Peninsula Communities

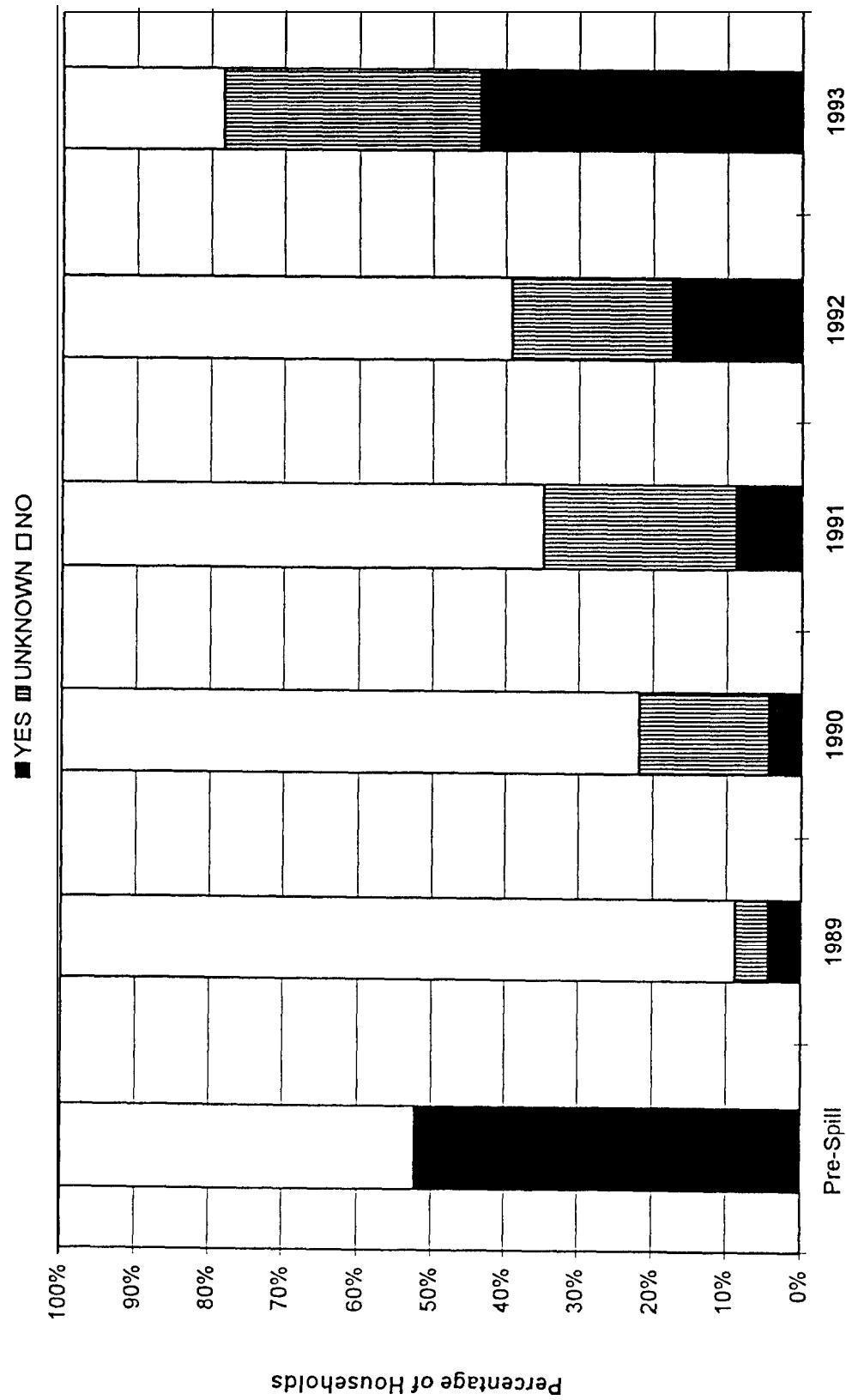
Table 13. Area Use Patterns for Preselected Areas, Chenega Bay, 1989

Area Name	Resource	Pre Spill						Post Spill					
		Not Present		No Response		Total Response		Used Yes		Used No		Total Response	
		%	N	%	N	%	N	%	N	%	N	%	N
Sawmill Bay	All Resources	5.6	1	5.6	1	88.9	16	93.8	15	6.3	1	94.4	17
Sawmill Bay	Salmon	5.6	1	5.6	1	88.9	16	62.5	10	37.5	6	5.6	1
Sawmill Bay	Finfish	5.6	1	5.6	1	88.9	16	68.8	11	31.3	5	5.6	1
Sawmill Bay	Big Game	5.6	1	5.6	1	88.9	16	12.5	2	87.5	14	5.6	1
Sawmill Bay	Marine Mammals	5.6	1	5.6	1	88.9	16	12.5	2	87.5	14	5.6	1
Sawmill Bay	Birds	5.6	1	5.6	1	88.9	16	12.5	2	87.5	14	5.6	1
Sawmill Bay	Shellfish	5.6	1	5.6	1	88.9	16	62.5	10	37.5	6	5.6	1
Evans Island	All Resources	5.6	1	5.6	1	88.9	16	68.8	11	31.3	5	5.6	1
Evans Island	Salmon	5.6	1	5.6	1	88.9	16	25.0	4	75.0	12	5.6	1
Evans Island	Finfish	5.6	1	5.6	1	88.9	16	6.3	1	93.8	15	5.6	1
Evans Island	Big Game	5.6	1	5.6	1	88.9	16	56.3	9	43.8	7	5.6	1
Evans Island	Marine Mammals	5.6	1	5.6	1	88.9	16	12.5	2	87.5	14	5.6	1
Evans Island	Birds	5.6	1	5.6	1	88.9	16	6.3	1	93.8	15	5.6	1
Evans Island	Shellfish	5.6	1	5.6	1	88.9	16	0.0	0	100.0	16	5.6	1
Erlington Passage	All Resources	5.6	1	5.6	1	88.9	16	62.5	1	37.5	6	5.6	1
Erlington Passage	Salmon	5.6	1	5.6	1	88.9	16	0.0	0	100.0	16	5.6	1
Erlington Passage	Finfish	5.6	1	5.6	1	88.9	16	50.0	8	50.0	8	5.6	1
Erlington Passage	Big Game	5.6	1	5.6	1	88.9	16	6.3	1	93.8	15	5.6	1
Erlington Passage	Marine Mammals	5.6	1	5.6	1	88.9	16	31.3	5	68.8	11	5.6	1
Erlington Passage	Birds	5.6	1	5.6	1	88.9	16	12.5	2	87.5	14	5.6	1
Erlington Passage	Shellfish	5.6	1	5.6	1	88.9	16	18.8	3	81.3	13	5.6	1

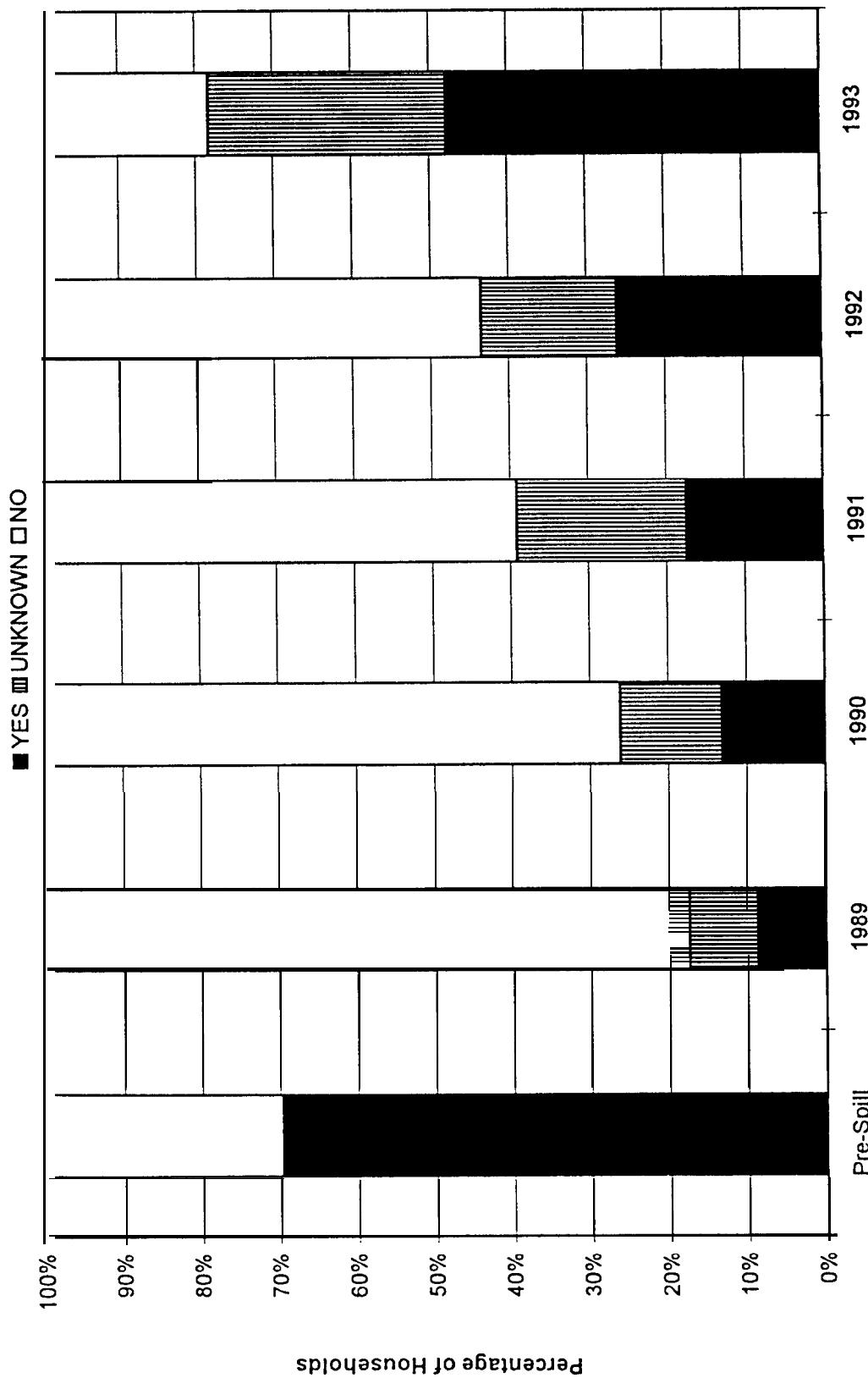
Cumulative Usage of Elrington Passage: Any Resource, Chenega Bay



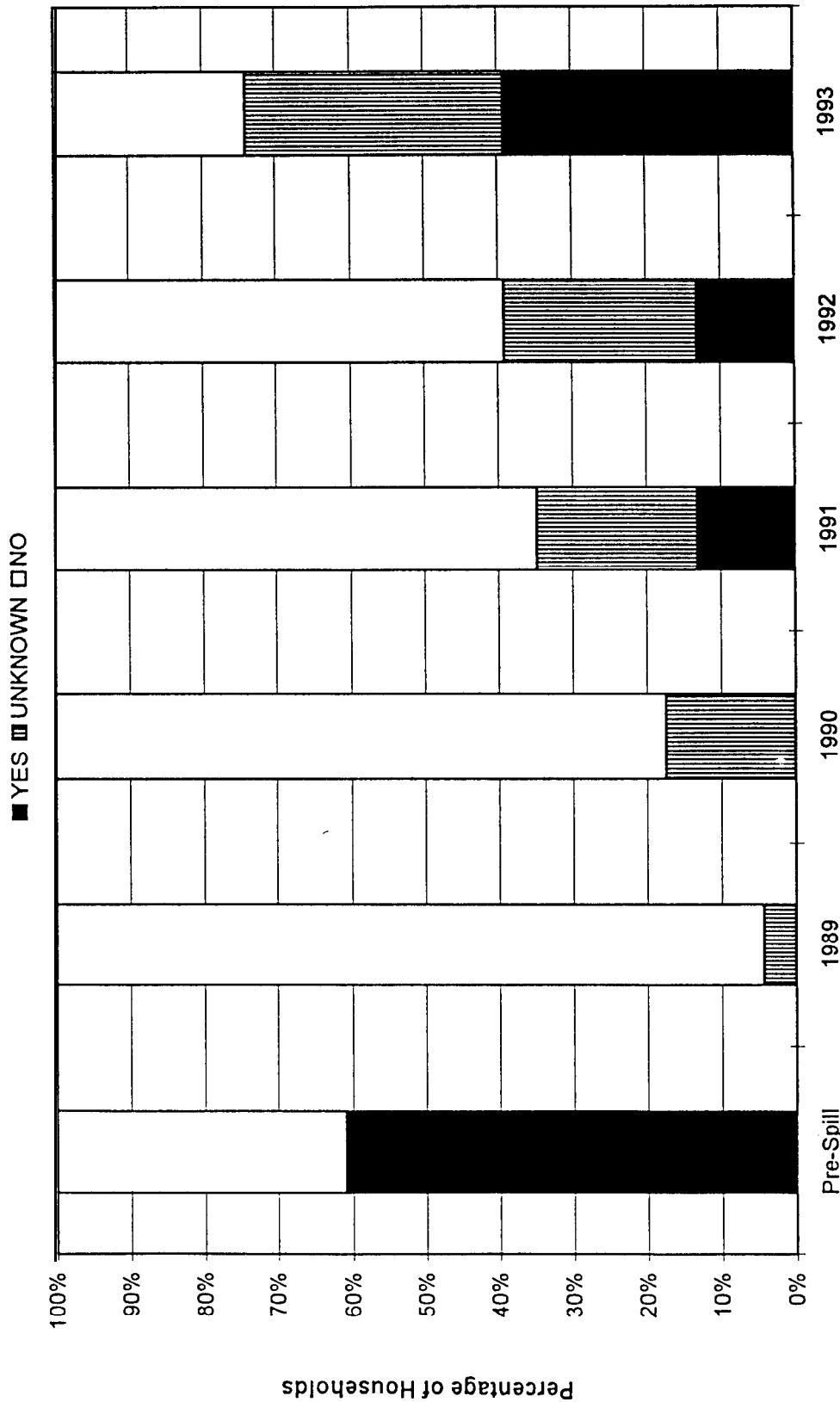
**Cumulative Usage of Ellington Passage: Salmon,
Chenega Bay**



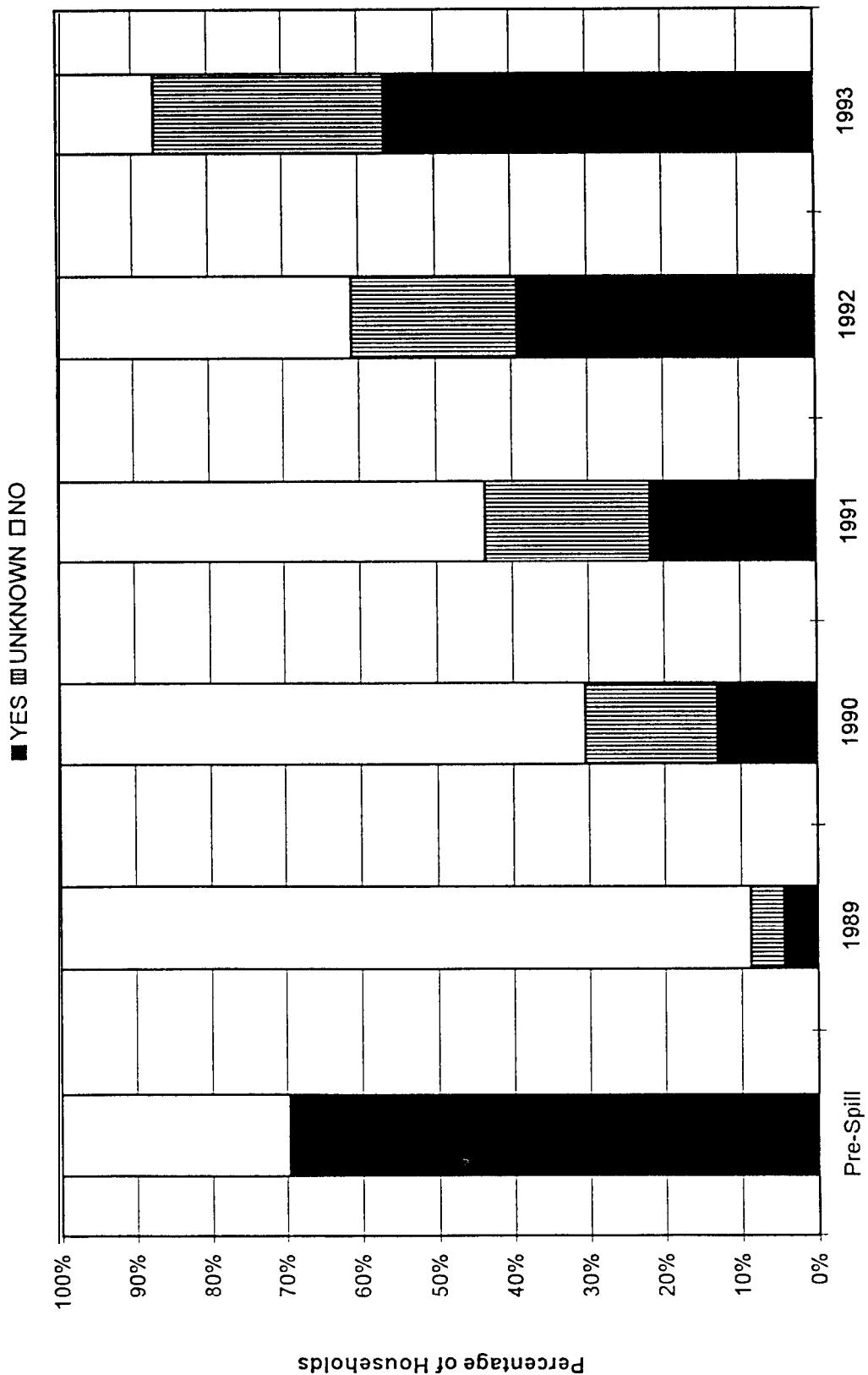
**Cumulative Usage of Elrington Passage: Fish Other Than Salmon,
Chenega Bay**



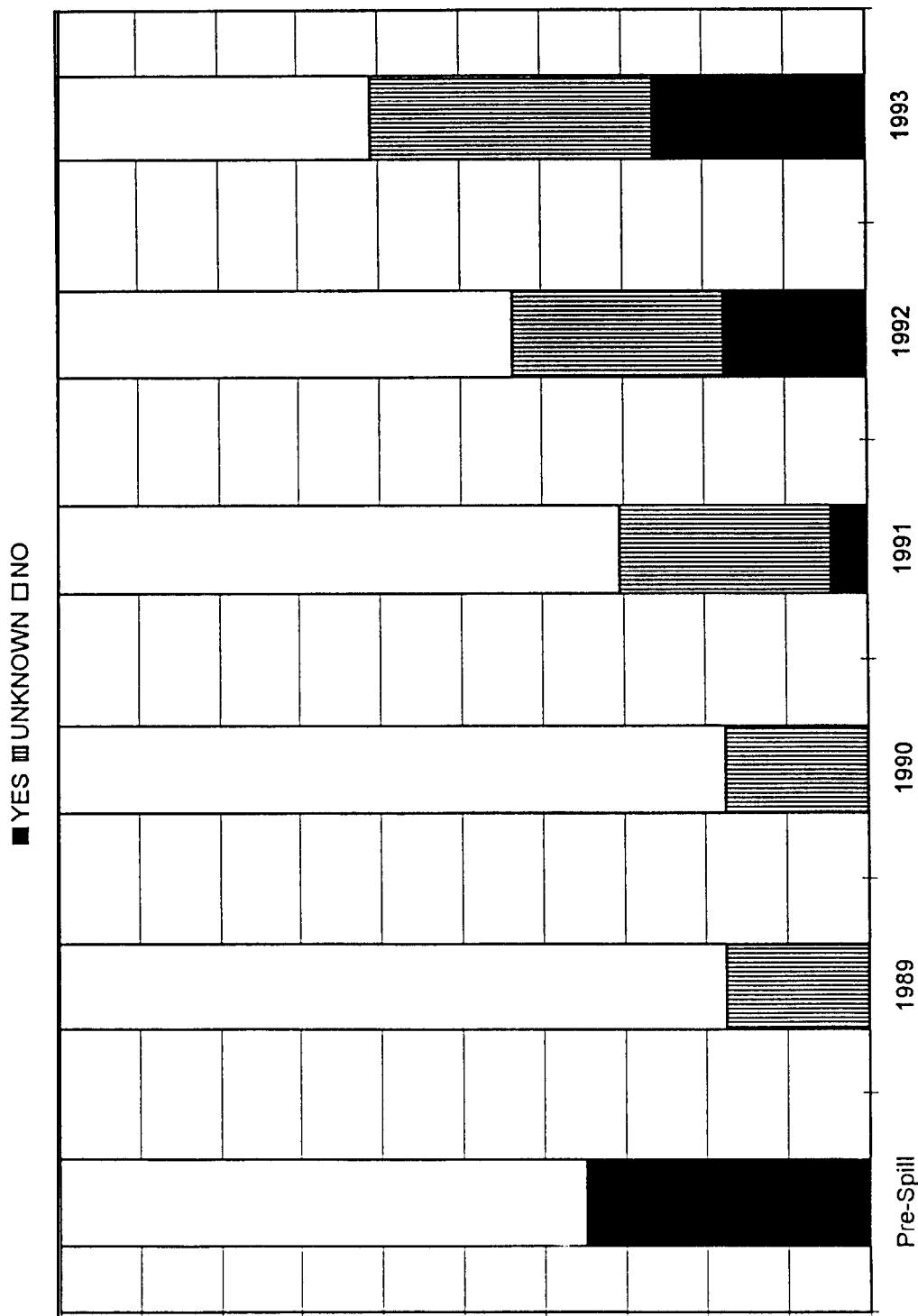
**Cumulative Usage of Elrington Passage: Marine Invertebrates,
Chenega Bay**



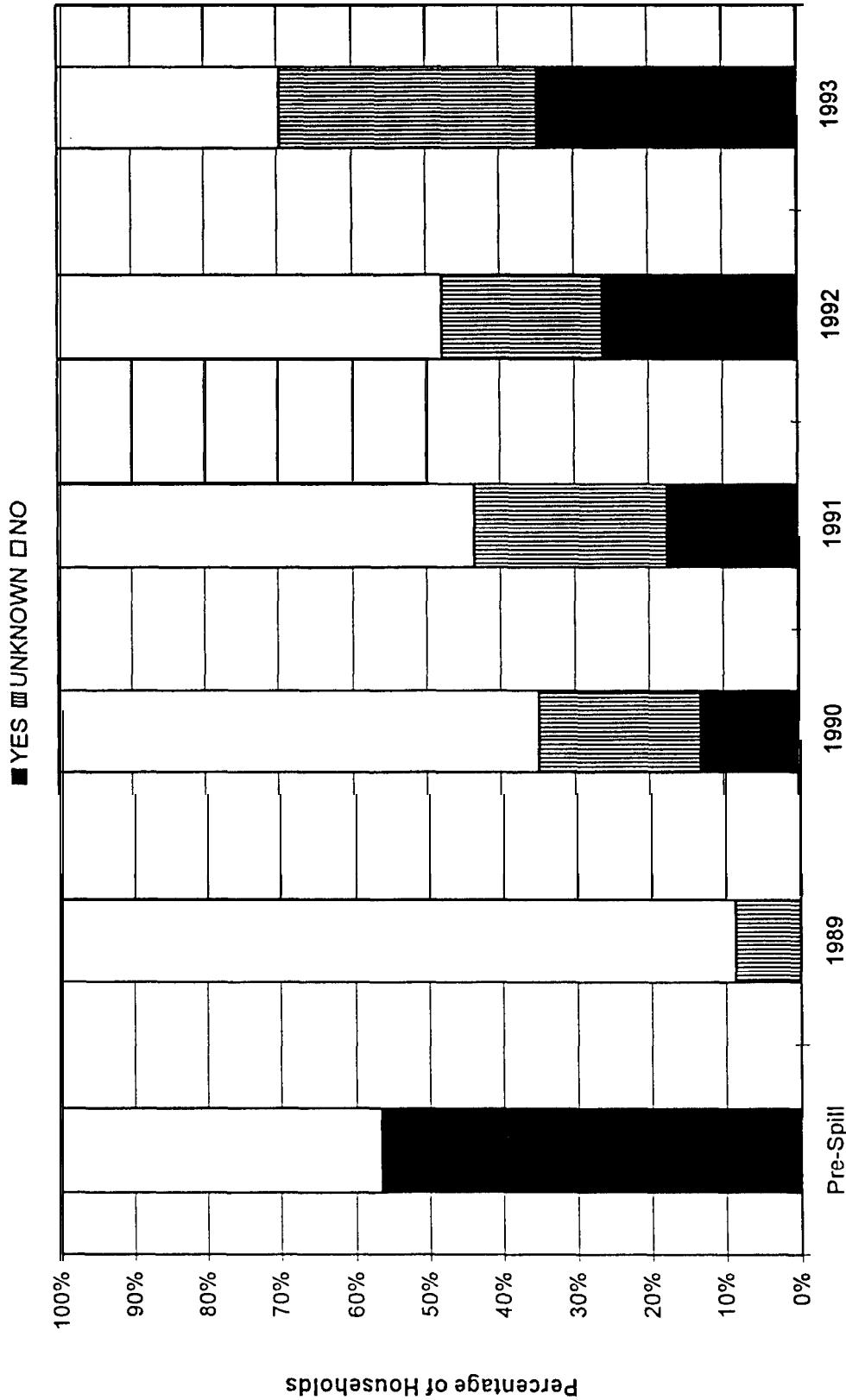
Cumulative Usage of Elrington Passage: Large Land Mammals, Chenega Bay



Cumulative Usage of Elrington Passage: Small Mammals/Furbearers, Chenega Bay

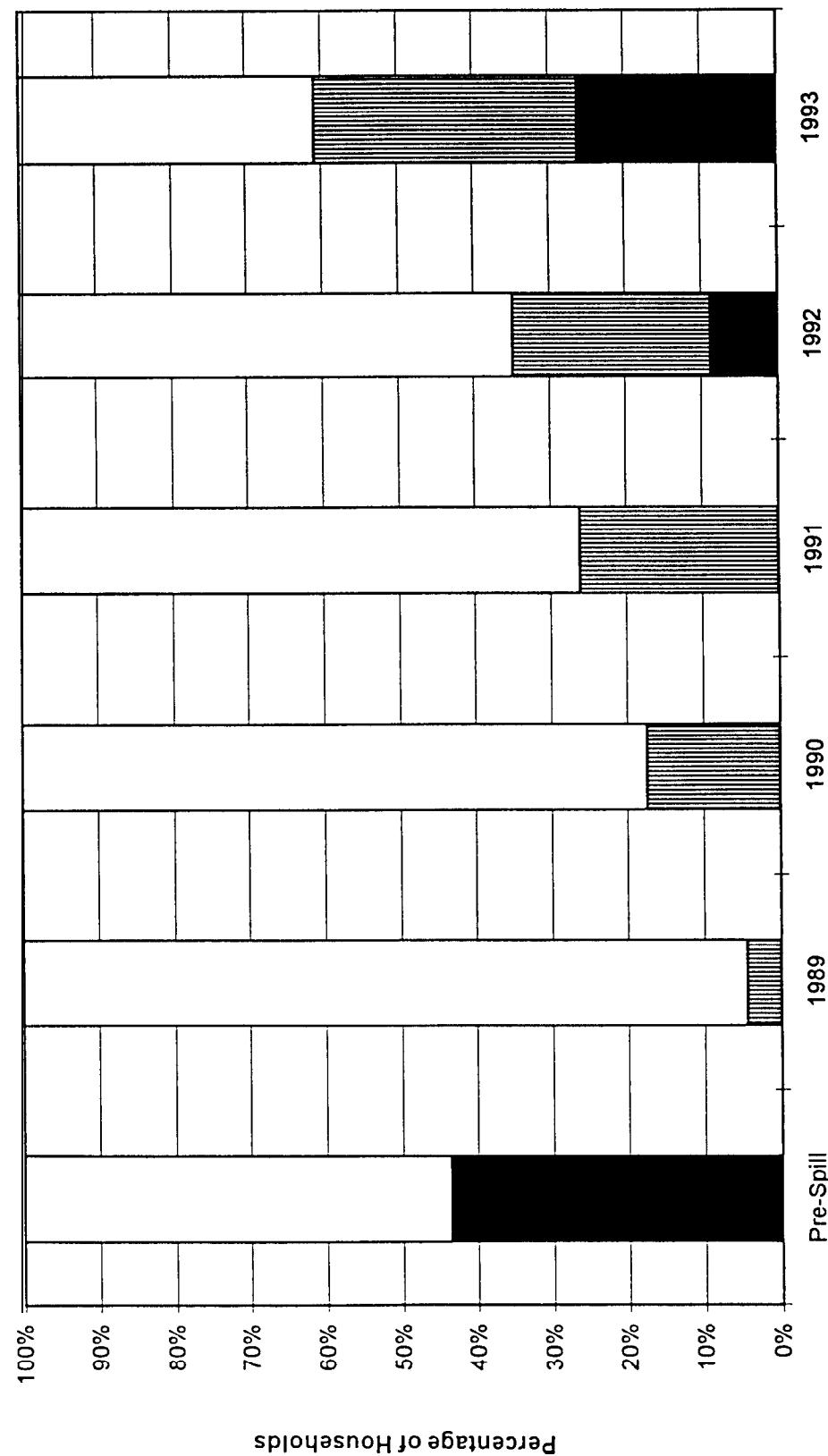


**Cumulative Usage of Elrington Passage: Marine Mammals,
Chenega Bay**

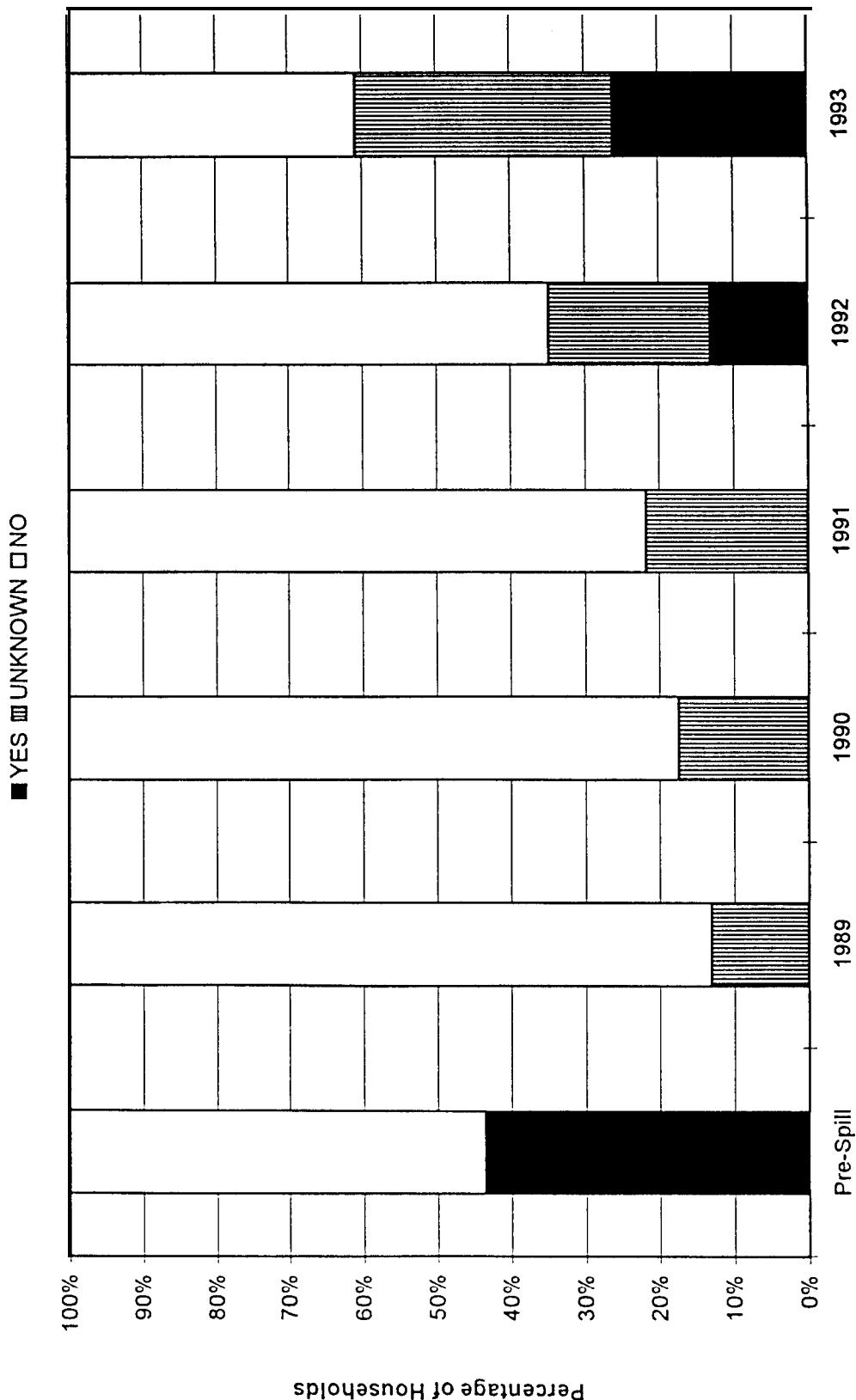


Cumulative Usage of Elrington Passage: Birds, Chenega Bay

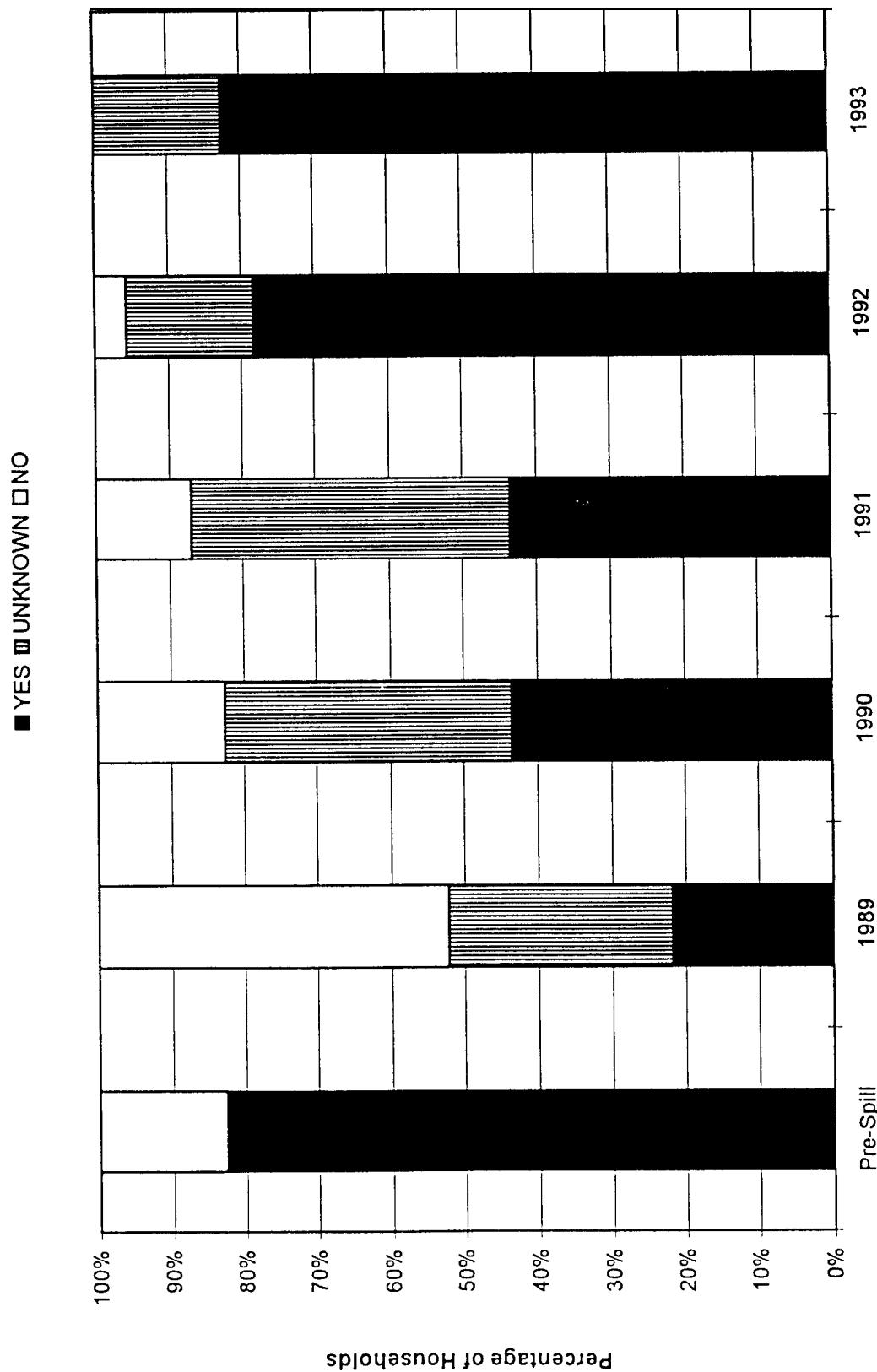
■ YES ▨ UNKNOWN □ NO



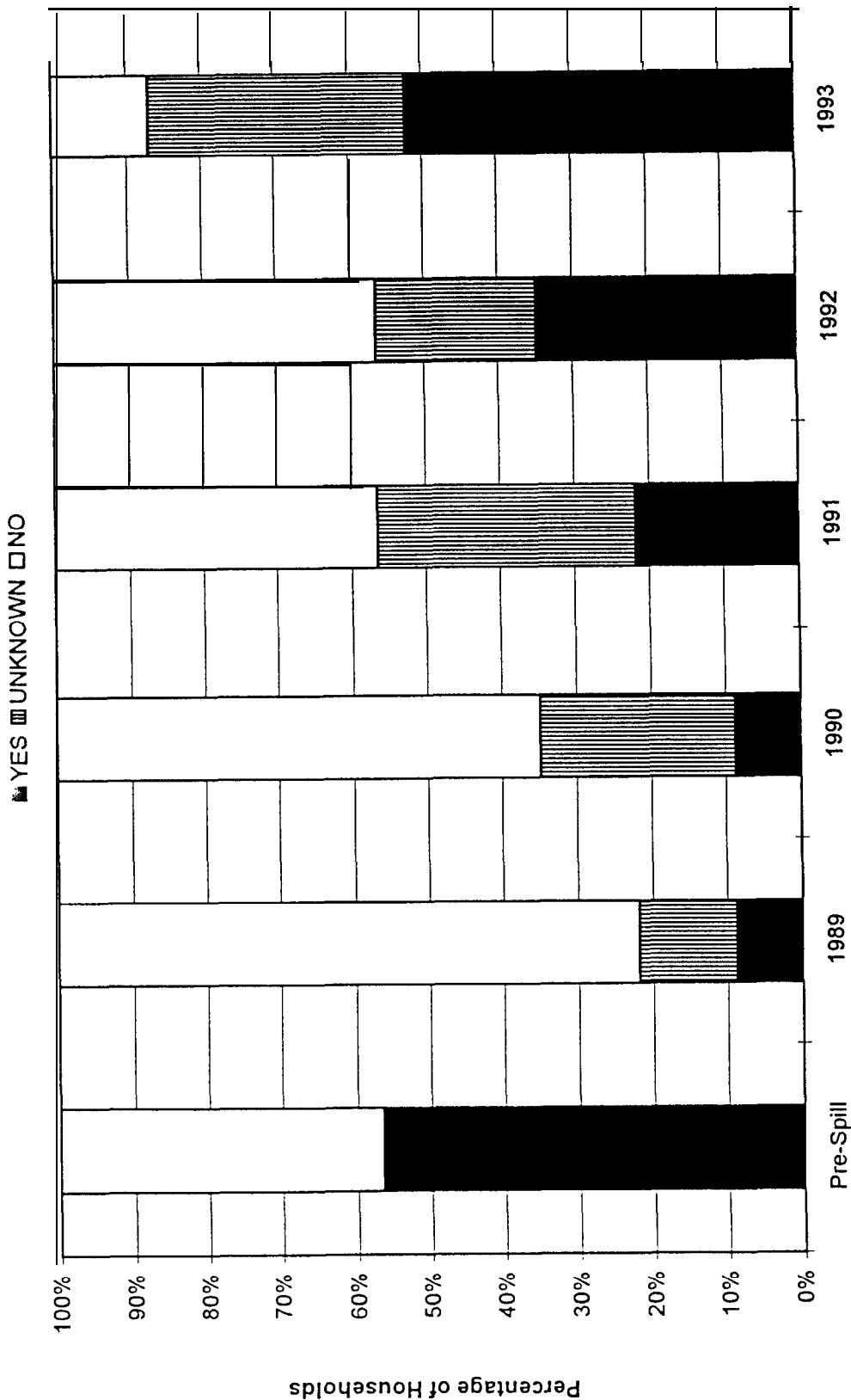
**Cumulative Usage of Elrington Passage: Plants,
Chenega Bay**



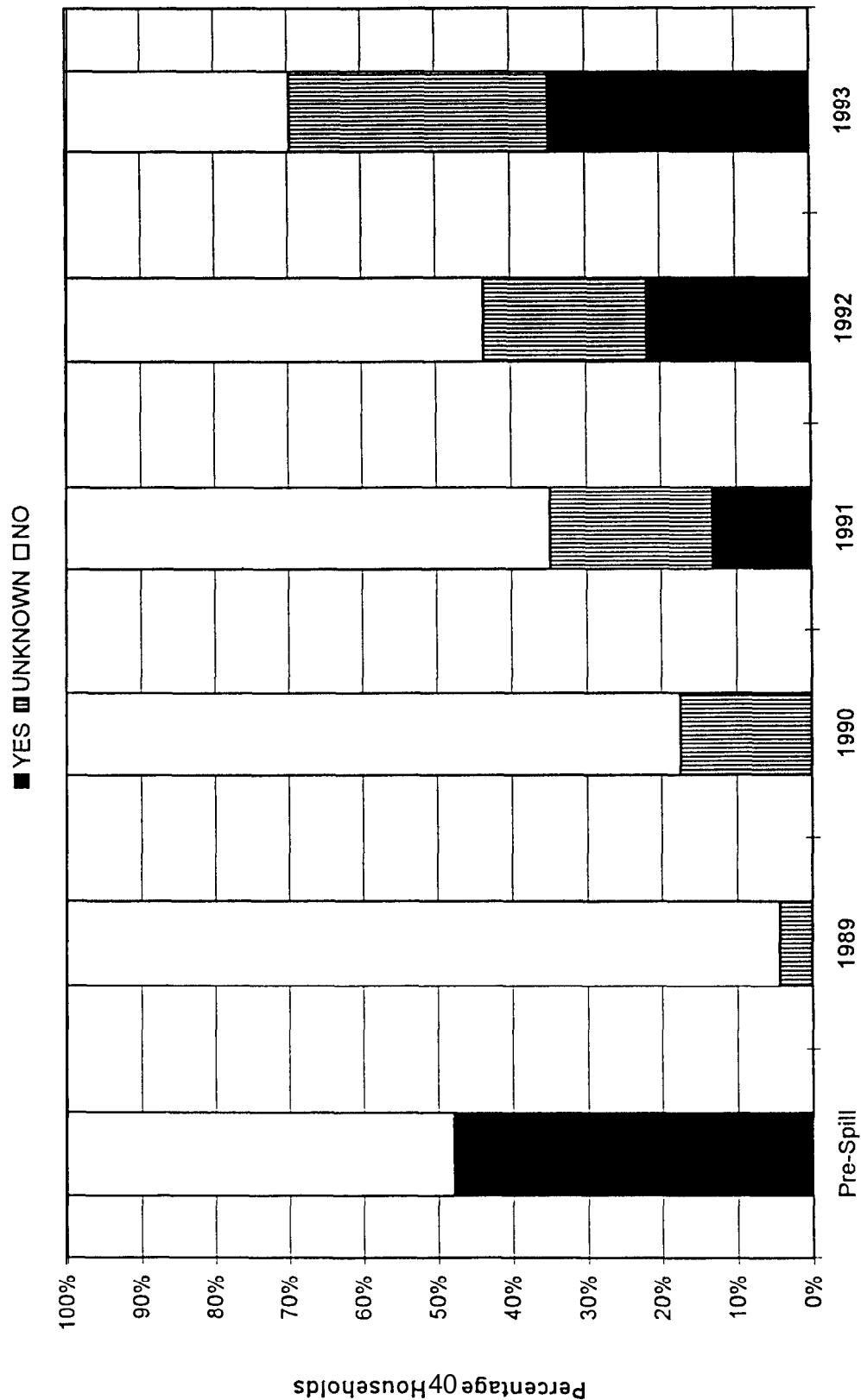
Cumulative Usage of Evans Island: Any Resource, Chenega Bay



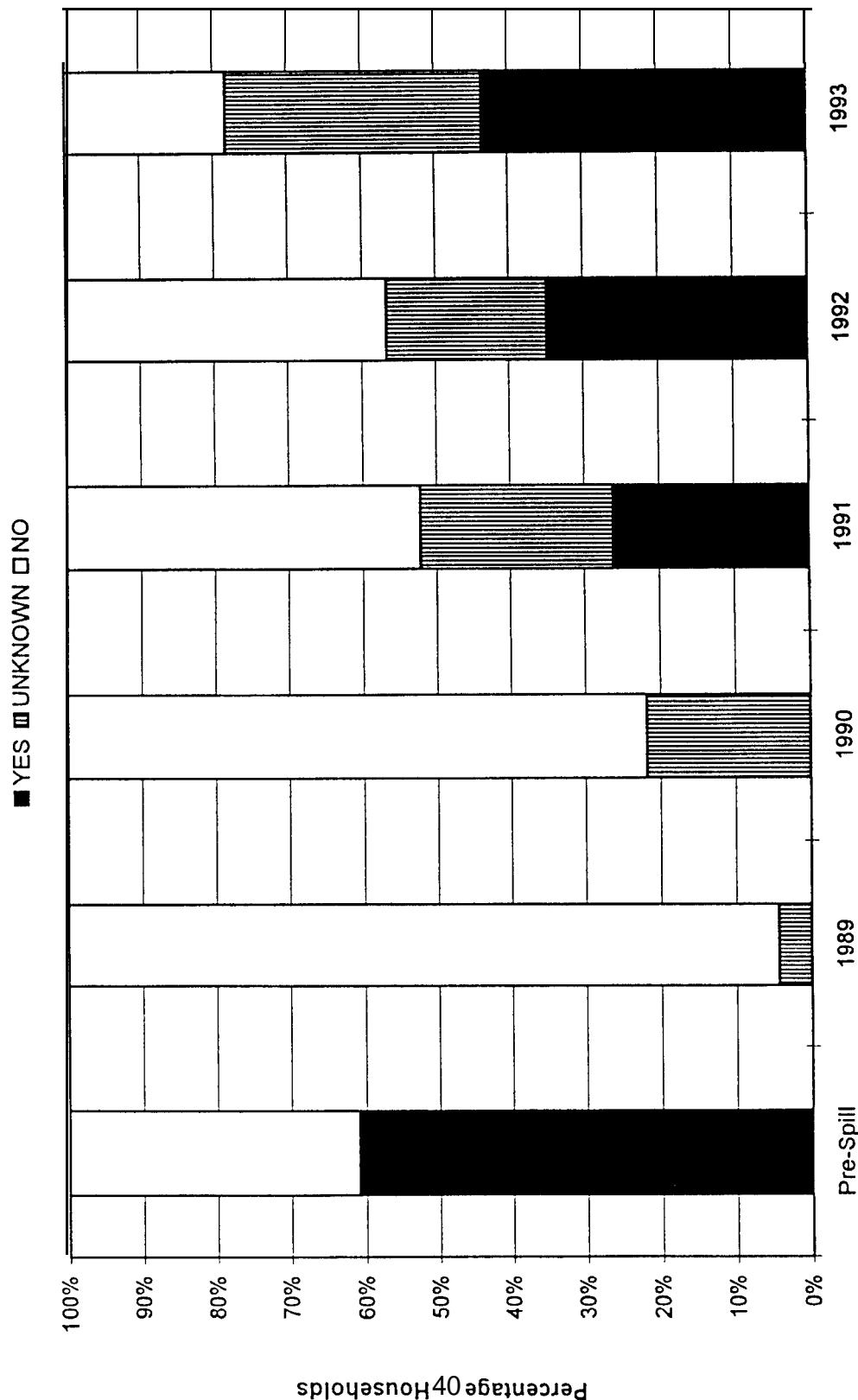
**Cumulative Usage of Evans Island: Salmon,
Chenega Bay**



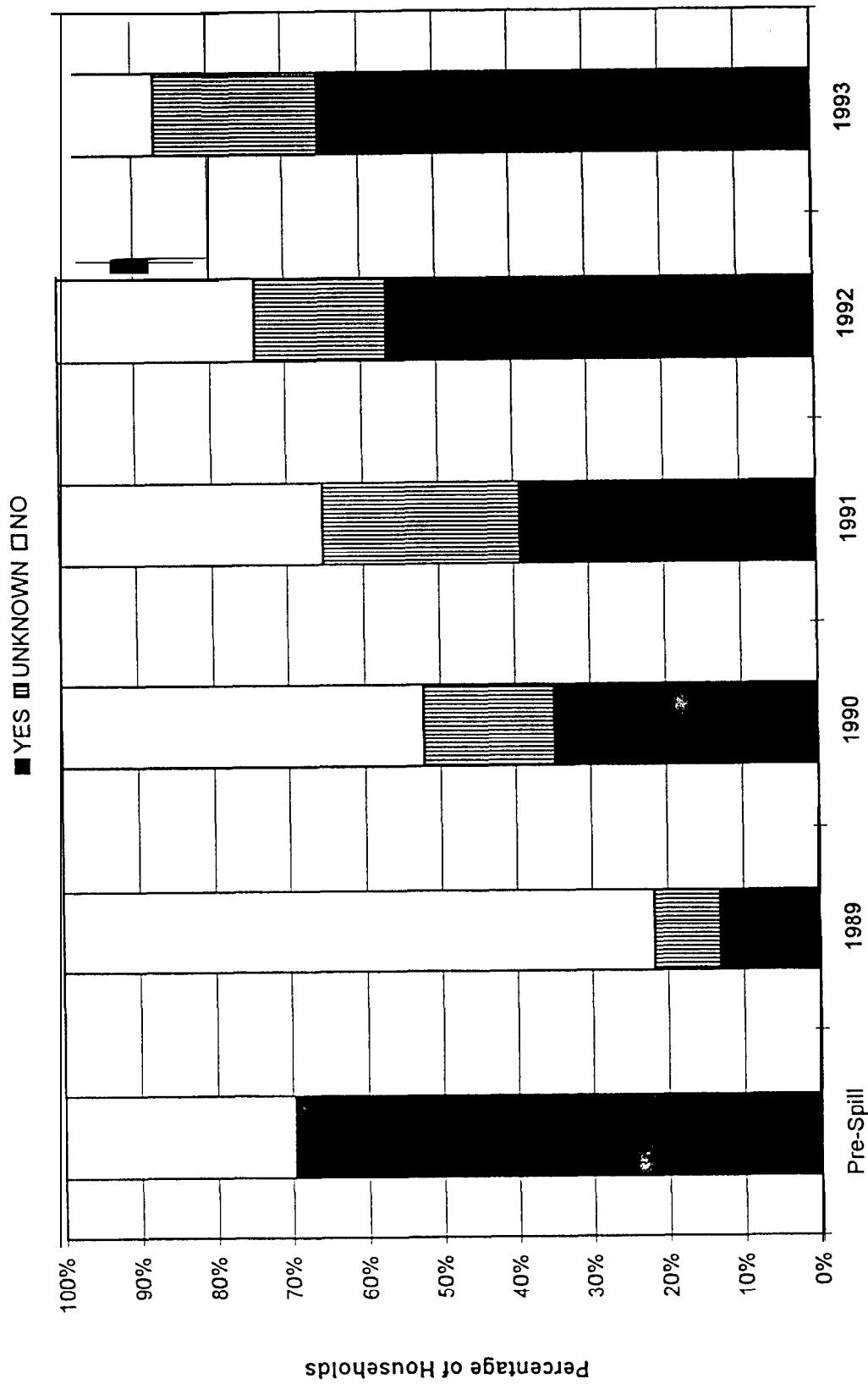
**Cumulative Usage of Evans Island: Fish Other Than Salmon,
Chenega Bay**



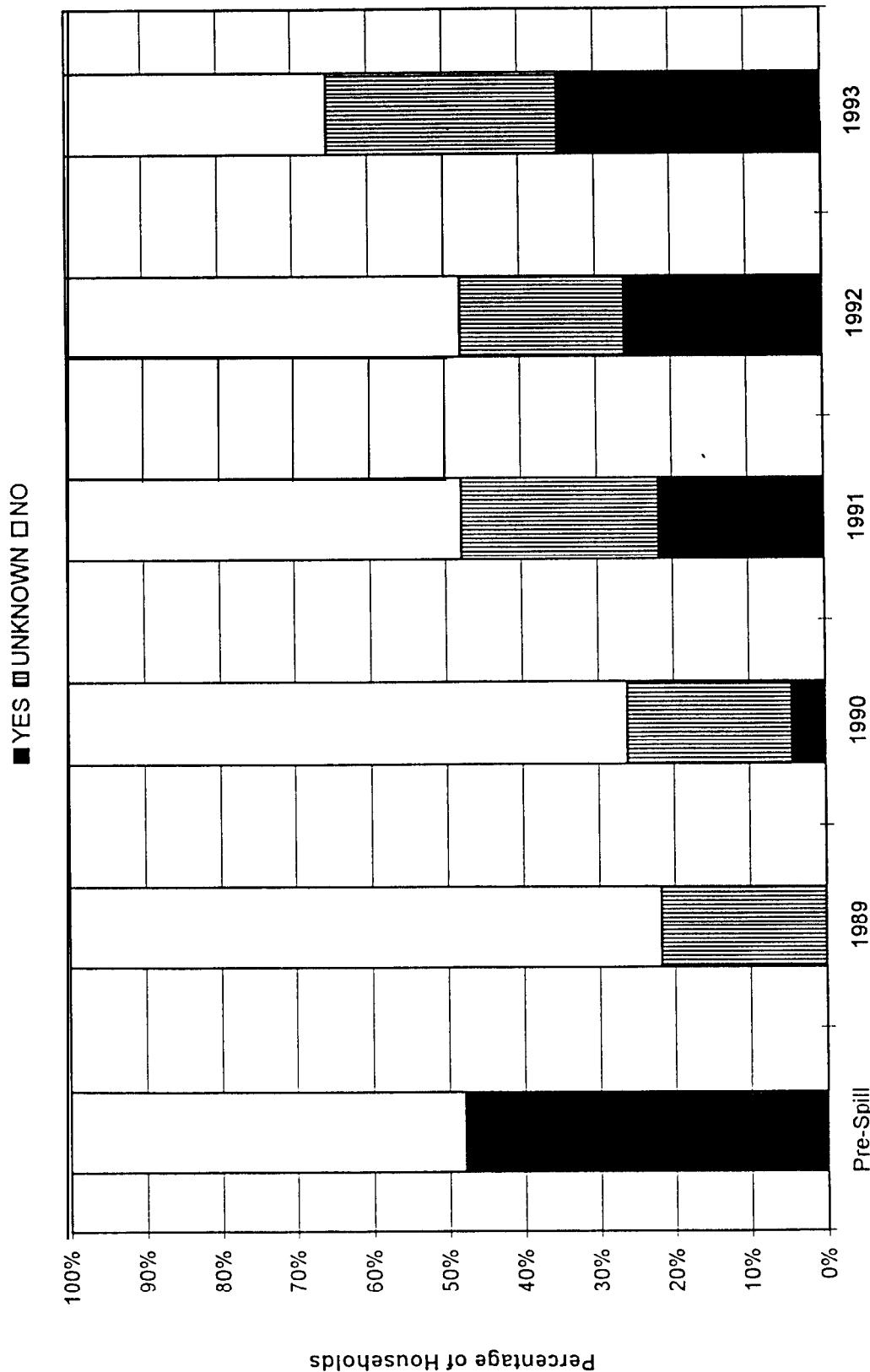
**Cumulative Usage of Evans Island: Marine Invertebrates,
Chenega Bay**



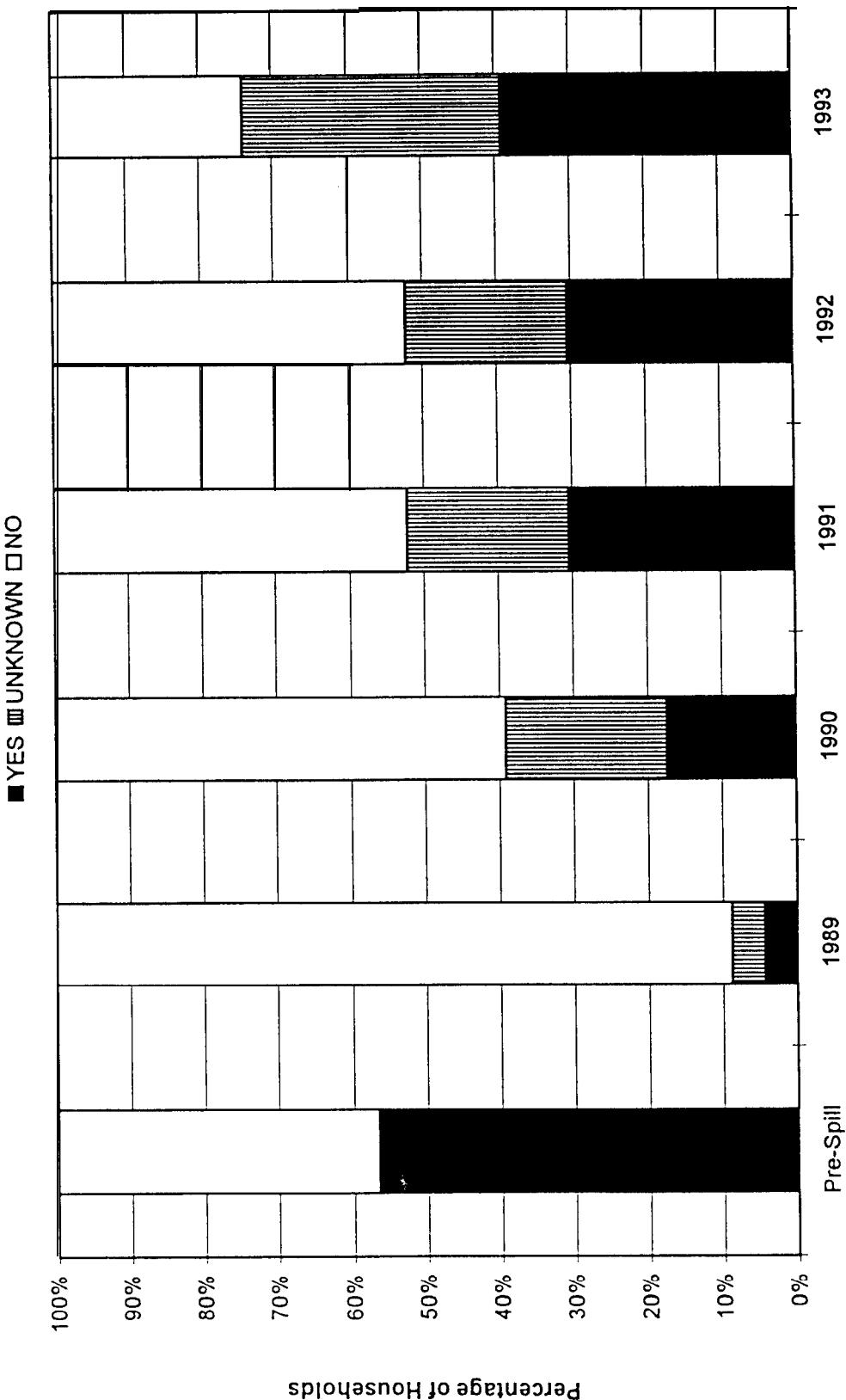
Cumulative Usage of Evans Island: Large Land Mammals, Chenega Bay



Cumulative Usage of Evans Island: Small Mammals/Furbearers, Chenega Bay

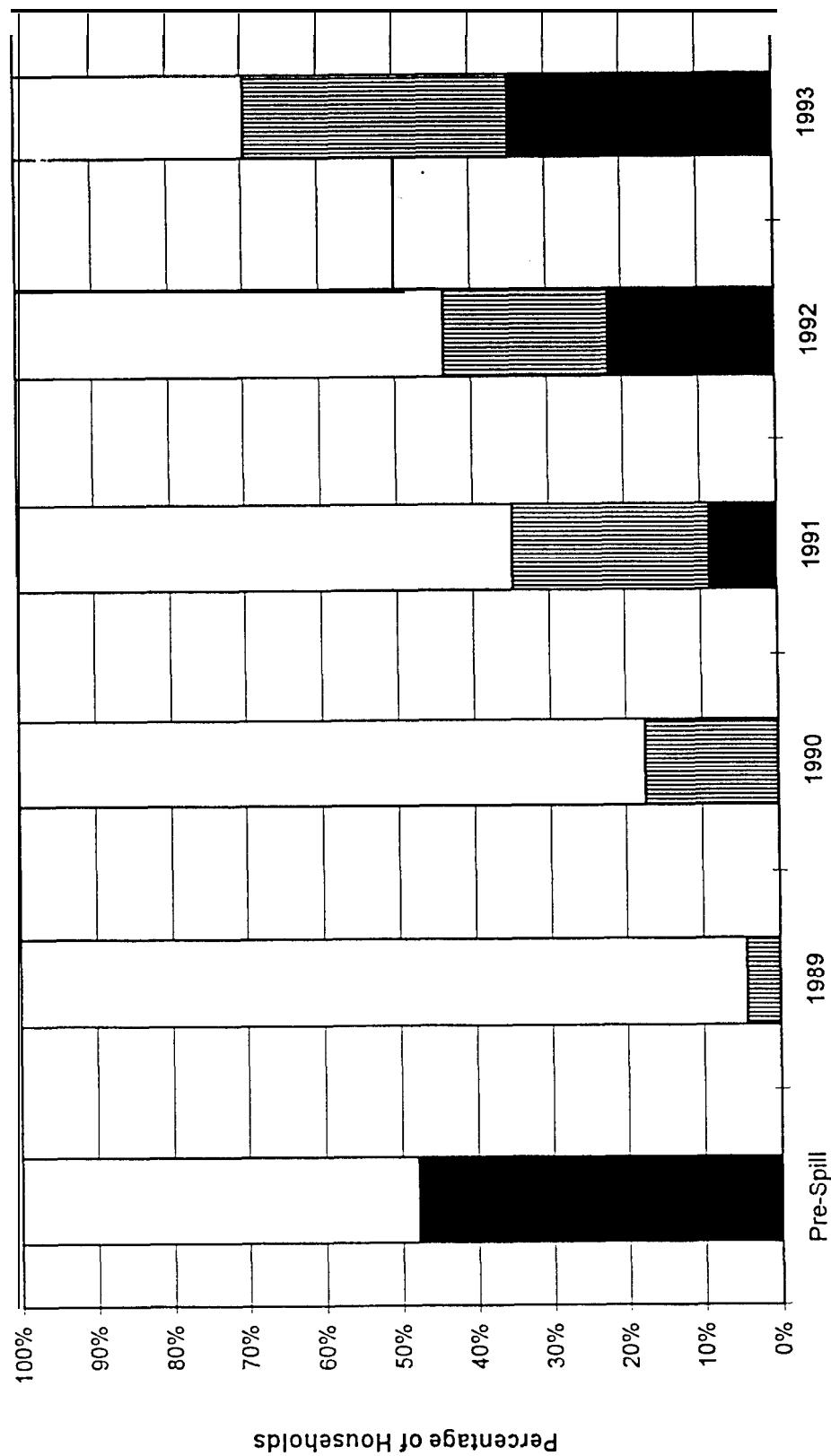


**Cumulative Usage of Evans Island: Marine Mammals,
Chenega Bay**

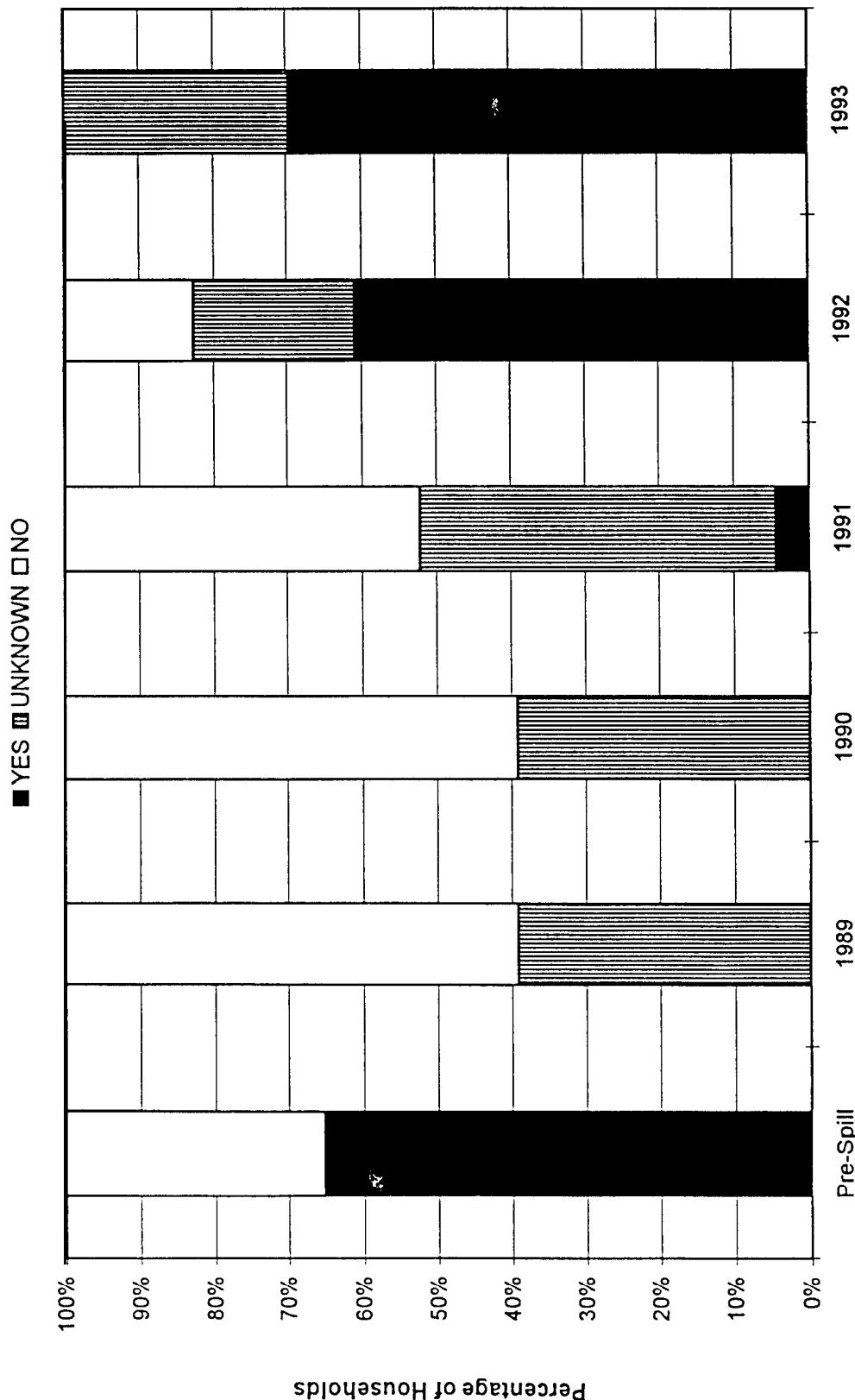


Cumulative Usage of Evans Island: Birds, Chenega Bay

■ YES ▨ UNKNOWN □ NO

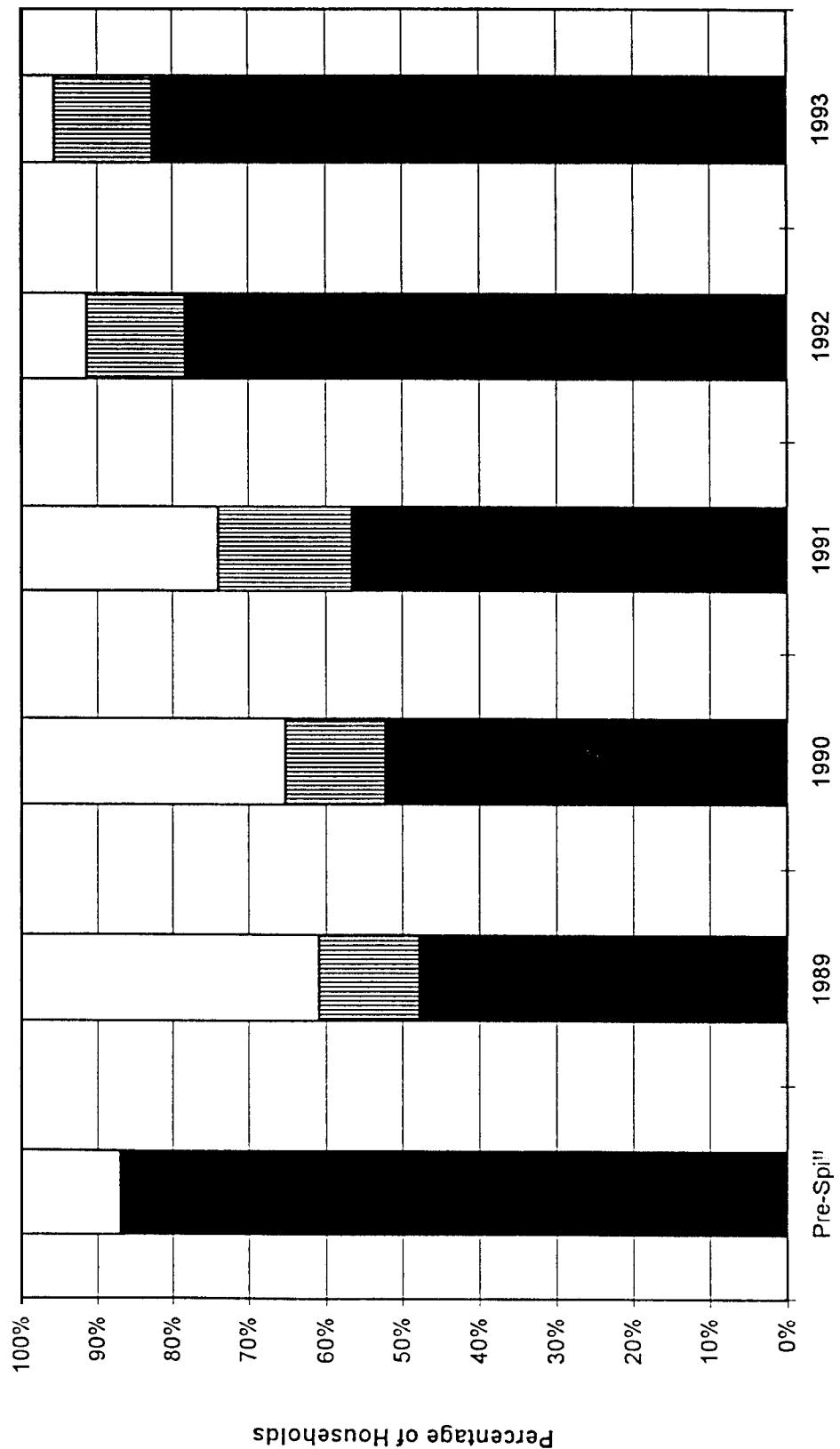


**Cumulative Usage of Evans Island: Plants,
Chenega Bay**

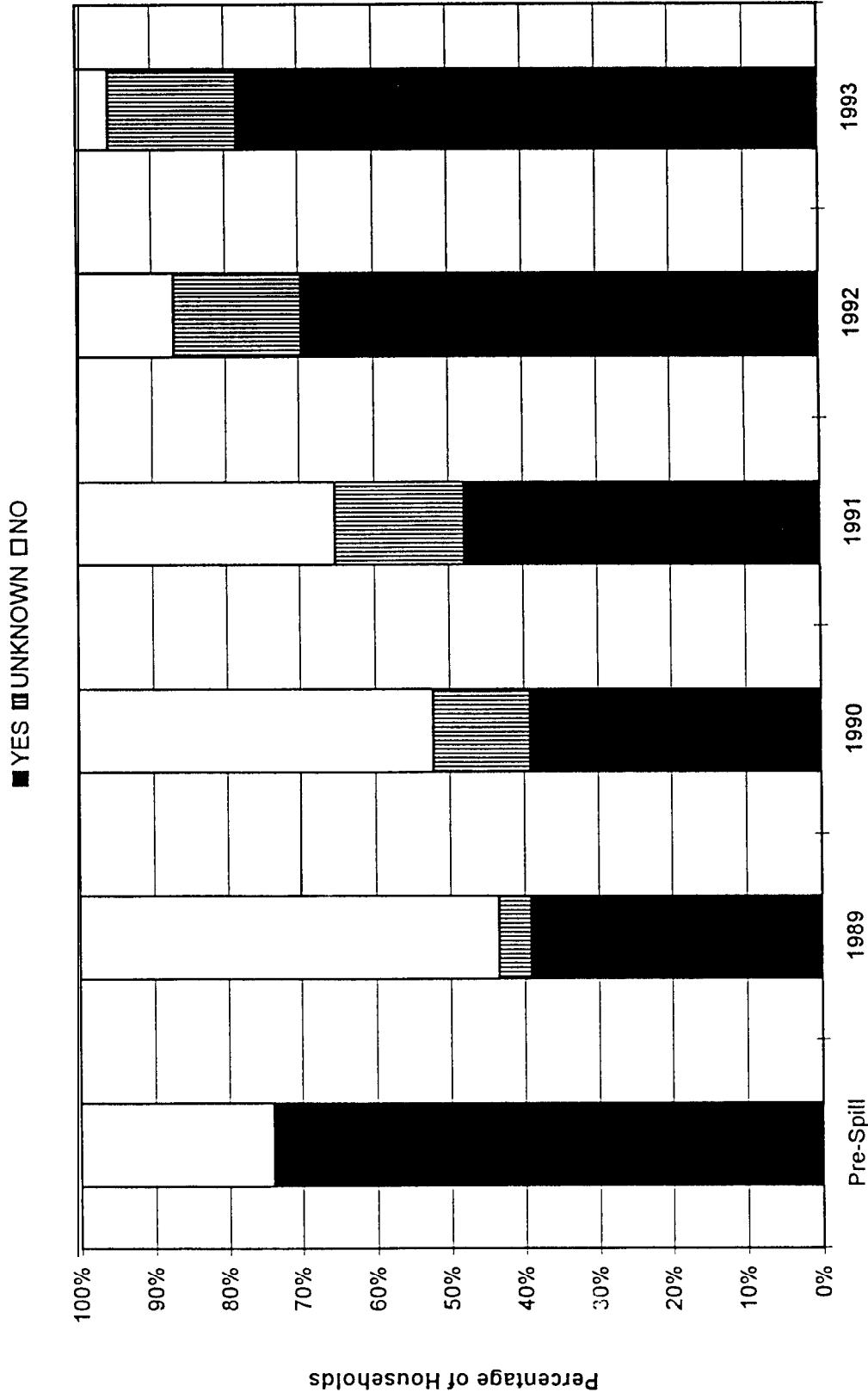


Cumulative Usage of Sawmill Bay: Any Resource, Chenega Bay

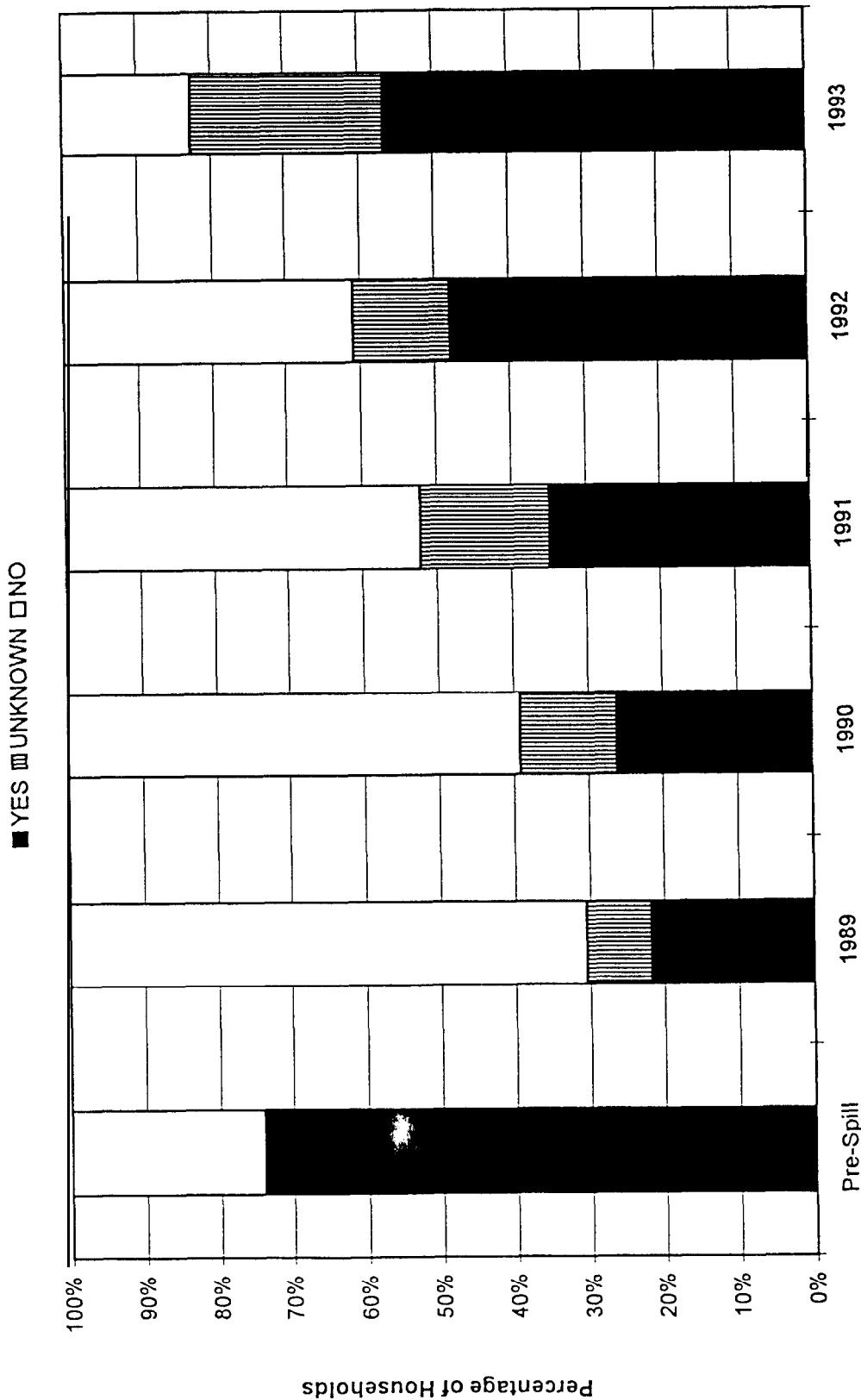
■ YES ▨ UNKNOWN □ NO



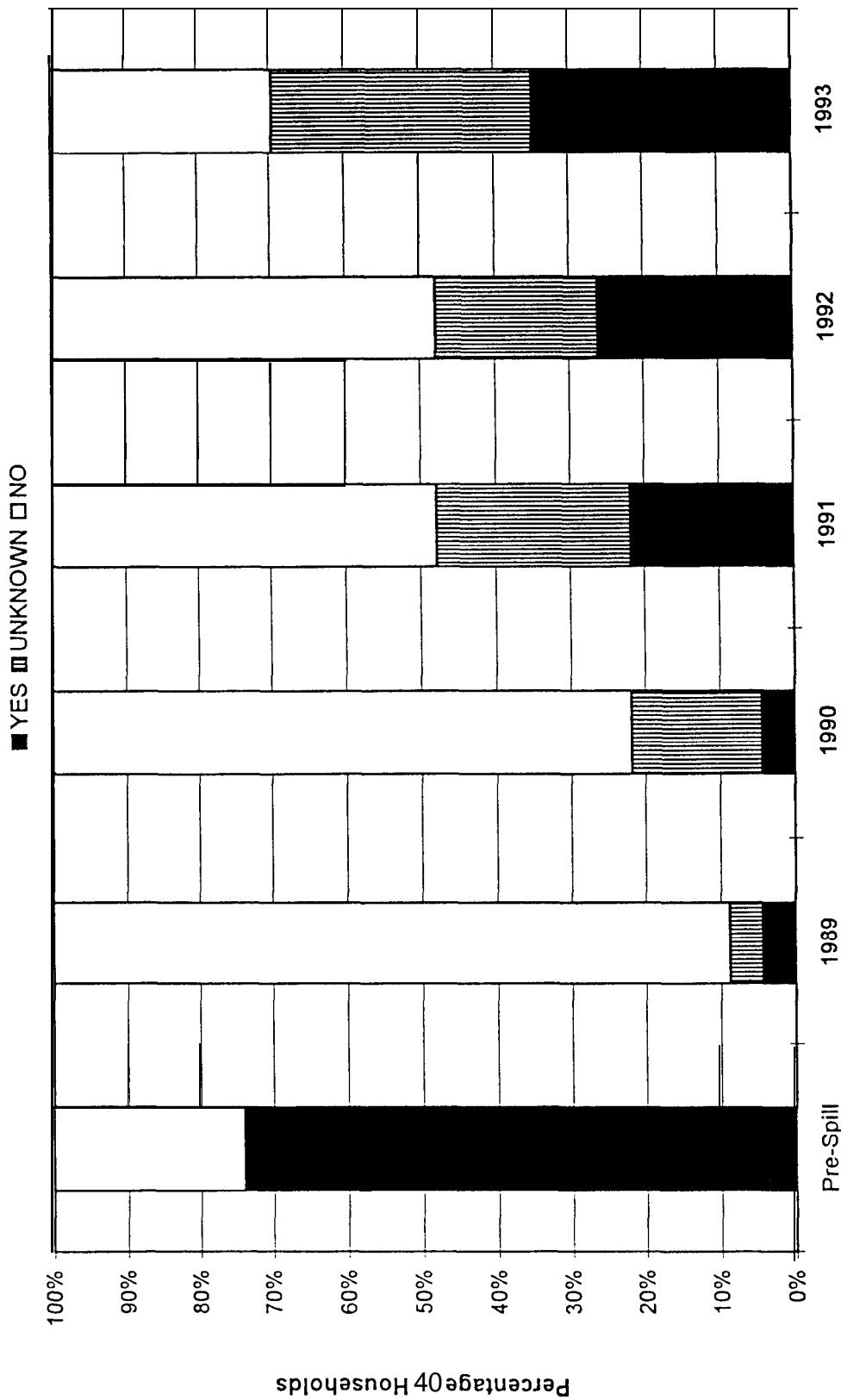
**Cumulative Usage of Sawmill Bay: Salmon,
Chenega Bay**



**Cumulative Usage of Sawmill Bay: Fish Other Than Salmon,
Chenega Bay**

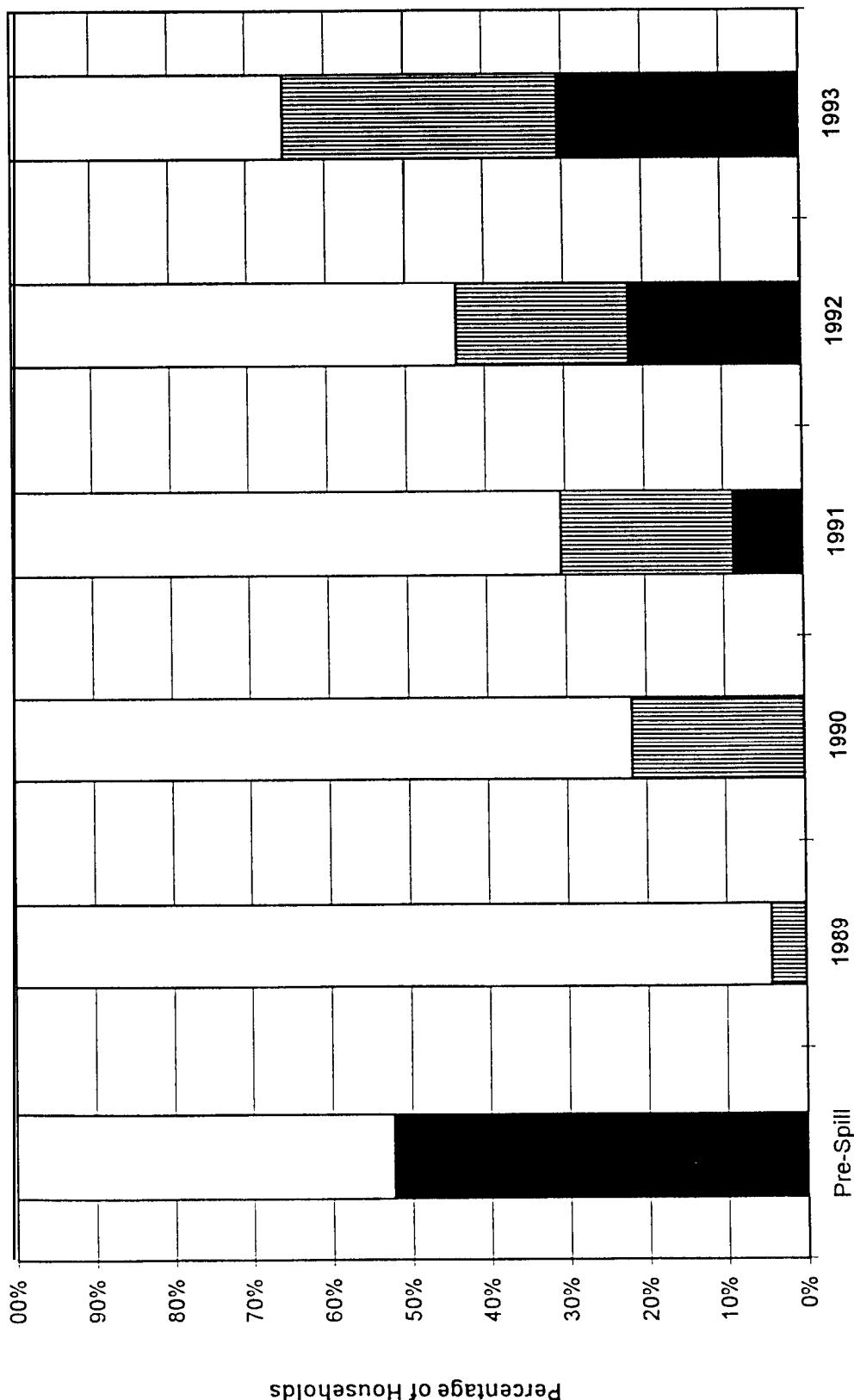


**Cumulative Usage of Sawmill Bay: Marine Invertebrates,
Chenega Bay**



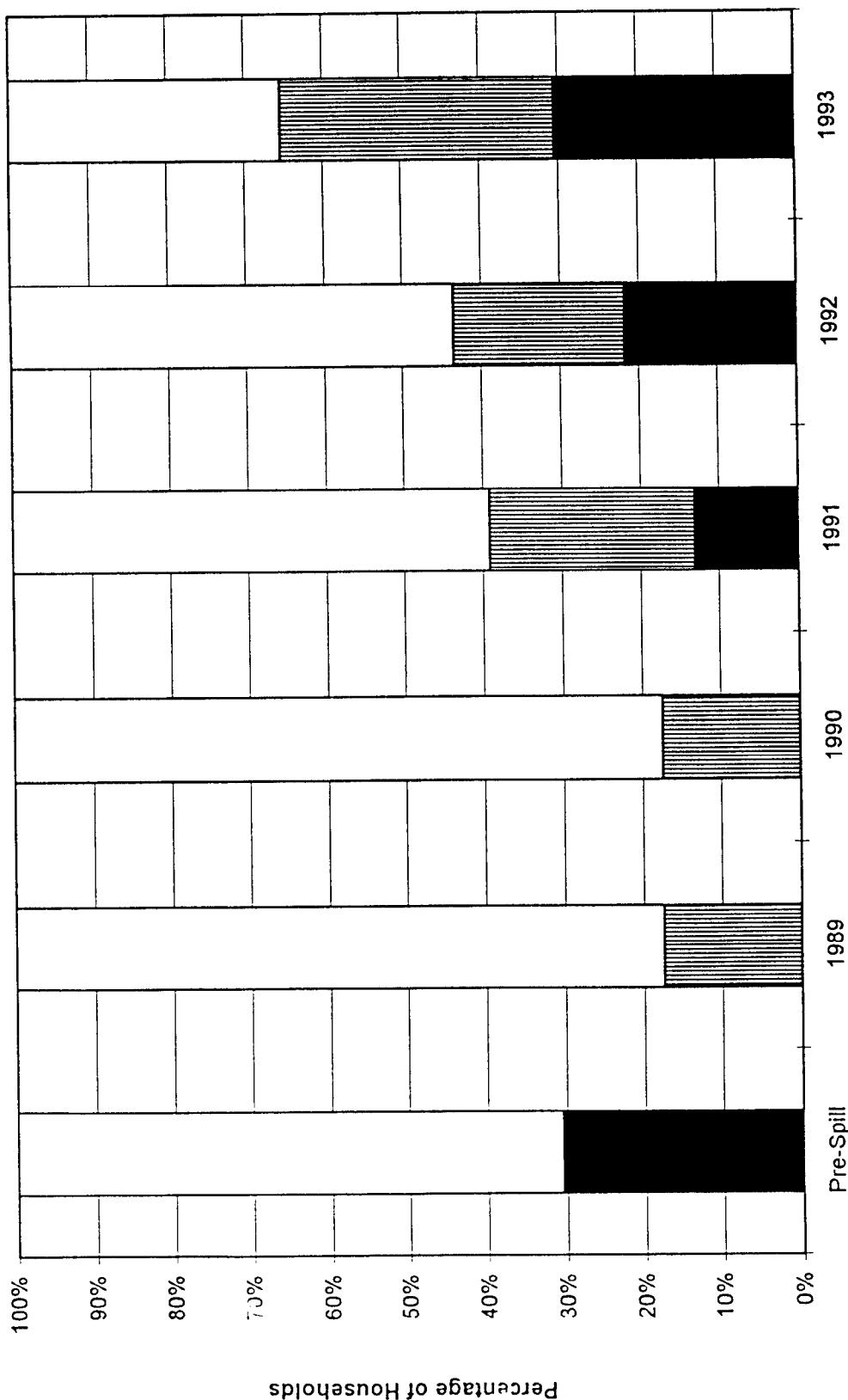
Cumulative Usage of Sawmill Bay: Large Land Mammals, Chenega Bay

■ YES ▨ UNKNOWN □ NO



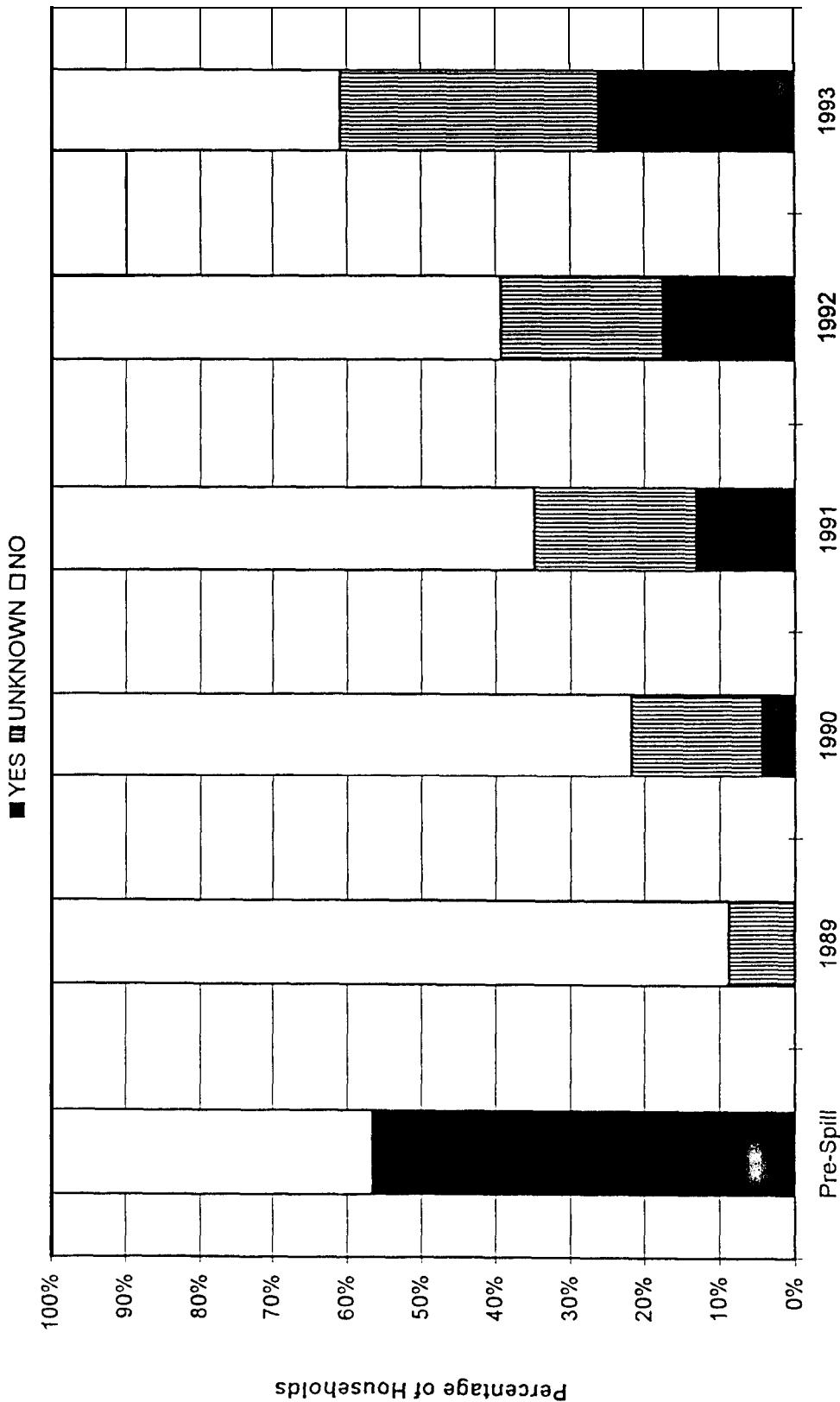
Cumulative Usage of Sawmill Bay: Small Mammals/Furbearers, Chenega Bay

■ YES ▨ UNKNOWN □ NO

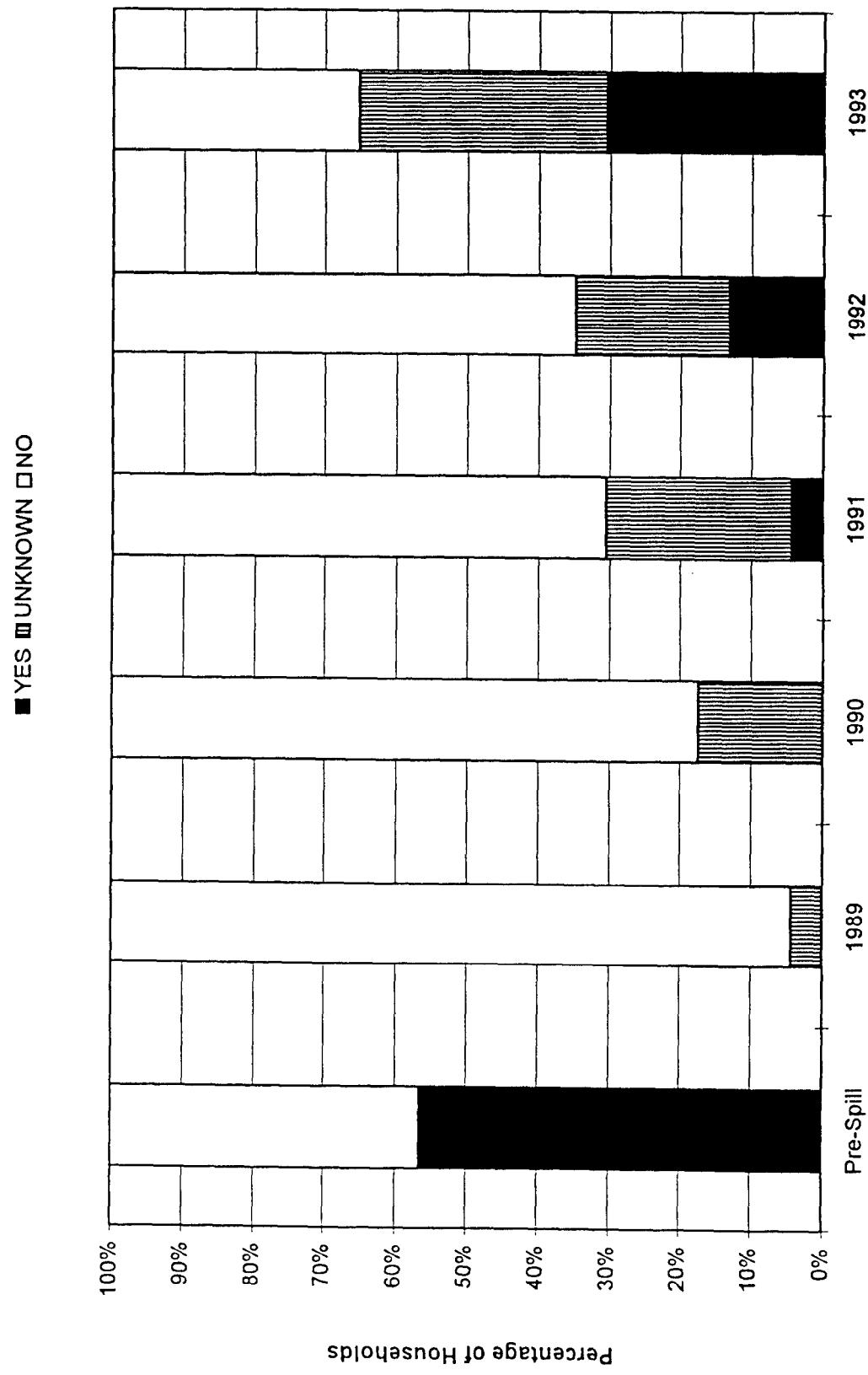


Percentage of Households

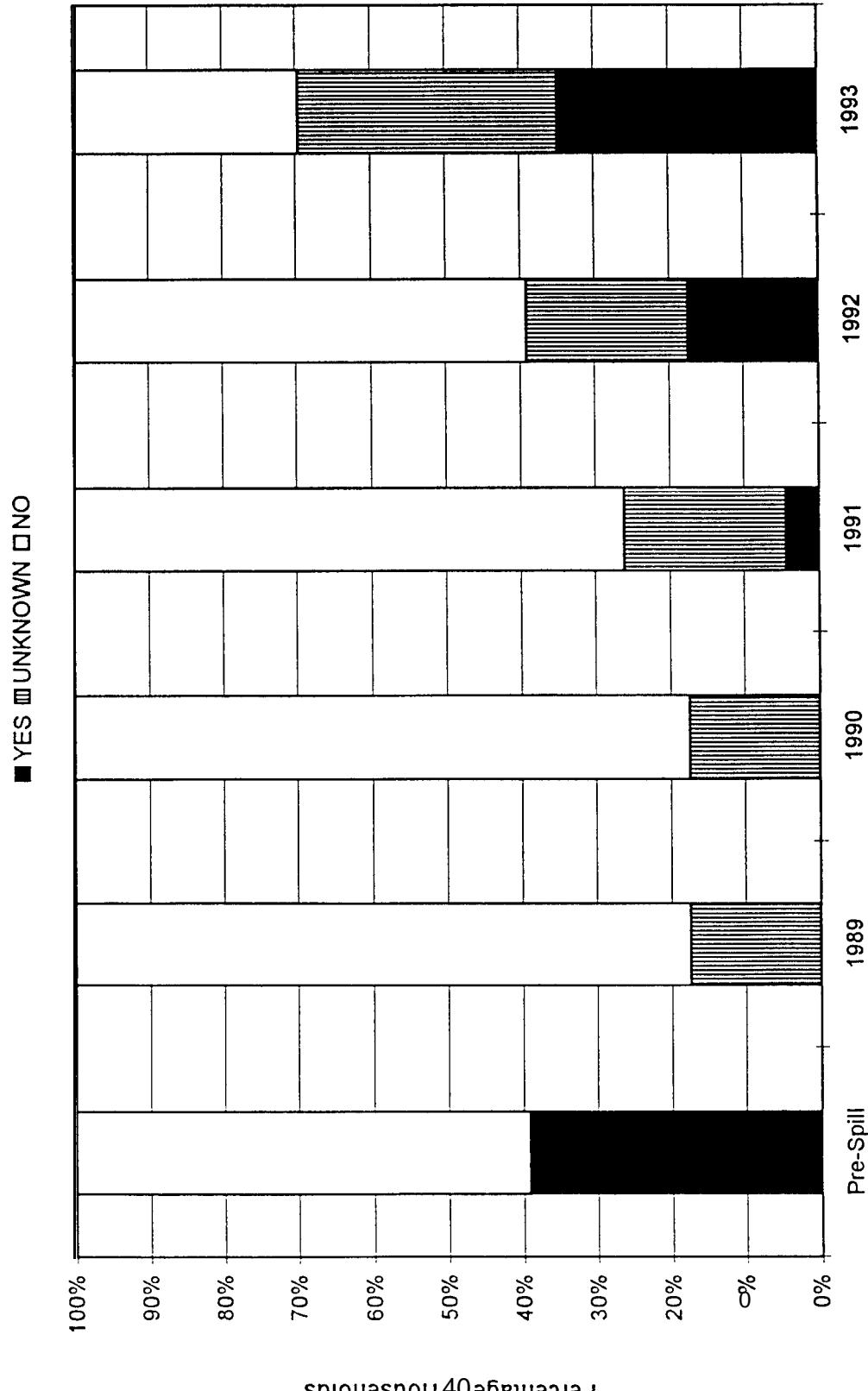
**Cumulative Usage of Sawmill Bay: Marine Mammals,
Chenega Bay**



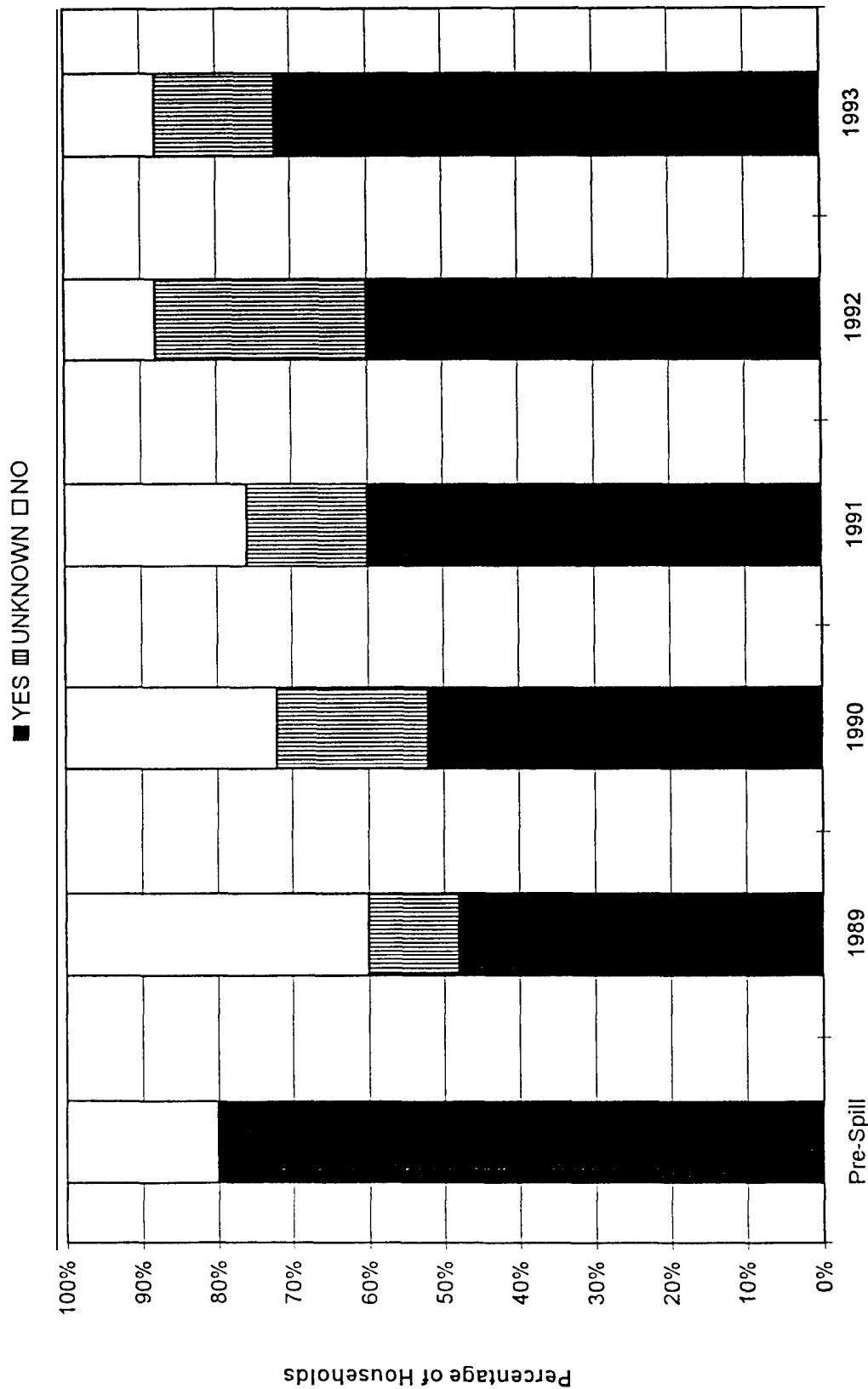
Cumulative Usage of Sawmill Bay: Birds, Chenega Bay



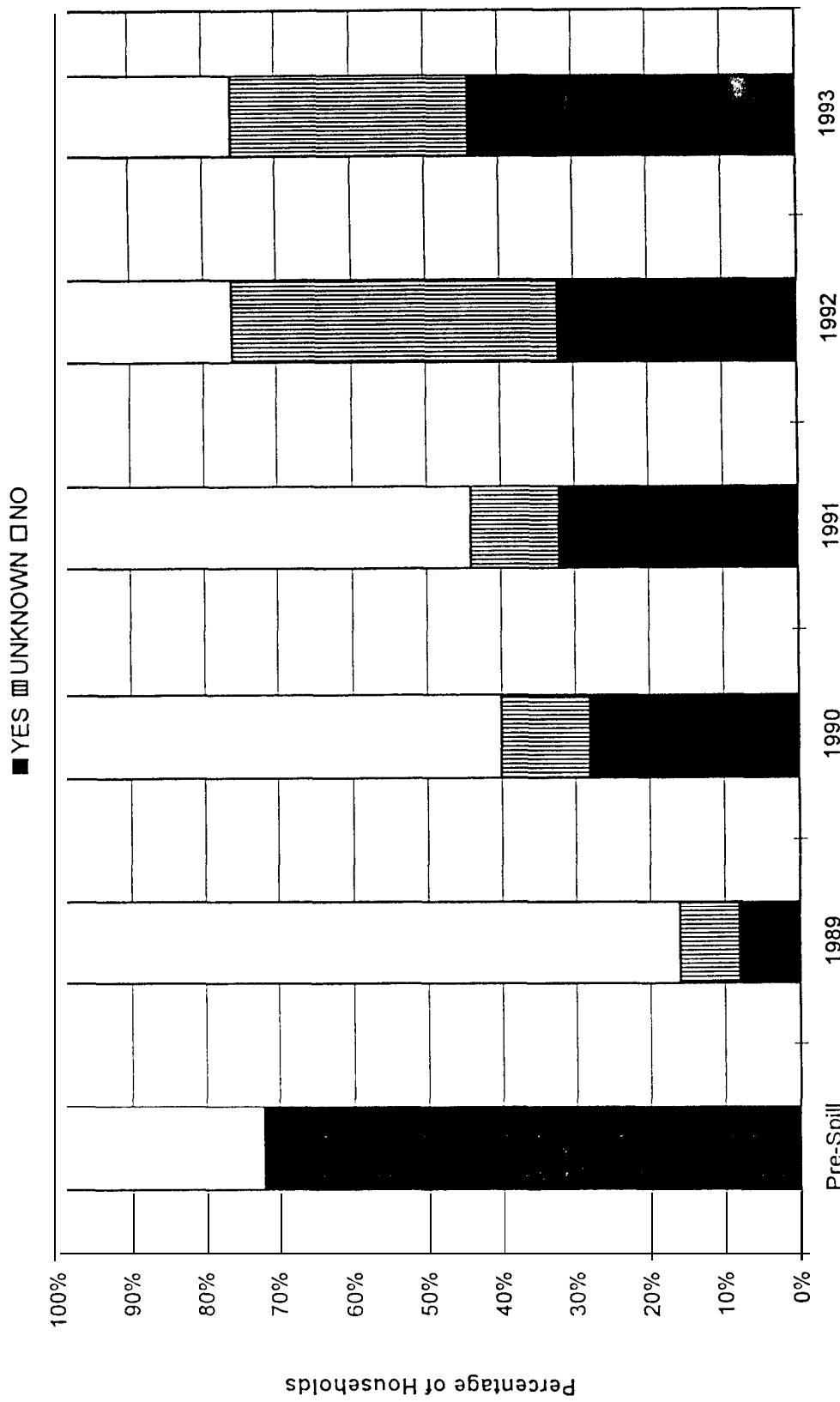
**Cumulative Usage of Sawmill Bay: Plants,
Chenega Bay**



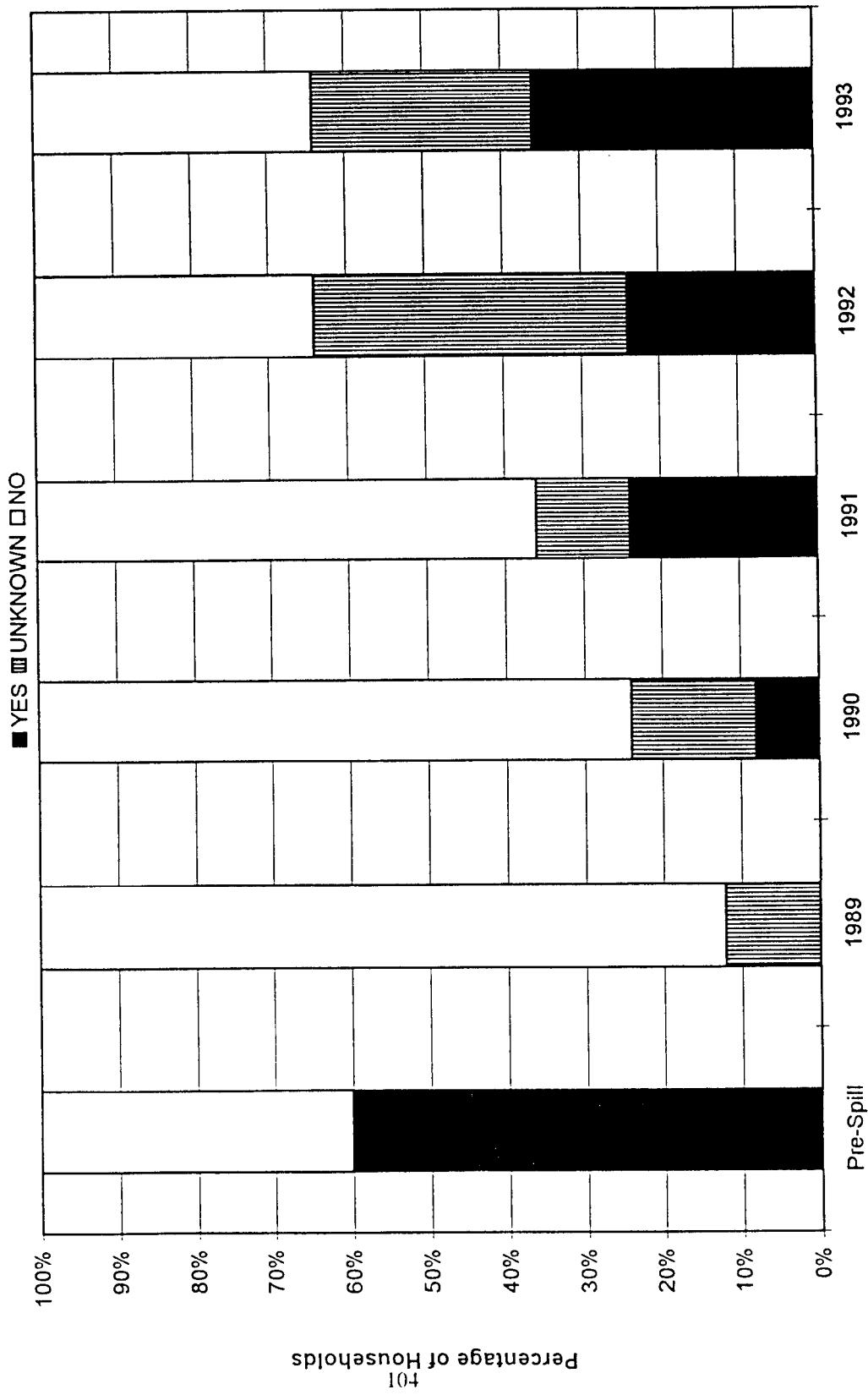
Cumulative Usage of Bligh, Reef, and Busby Islands: Any Resource, Tatitlek



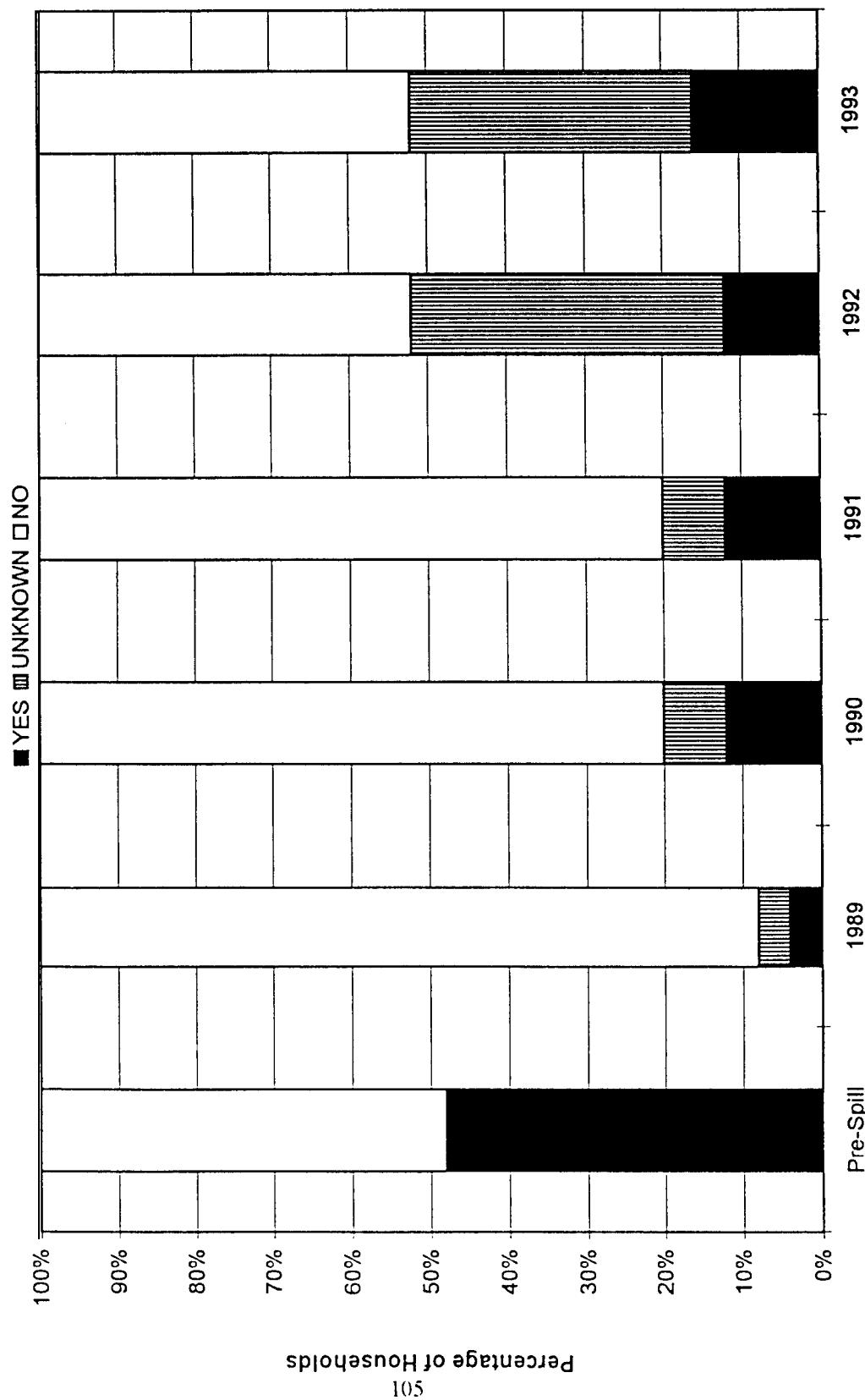
Cumulative Usage of Bligh, Reef, and Busby Islands: Salmon,
Tatitlek



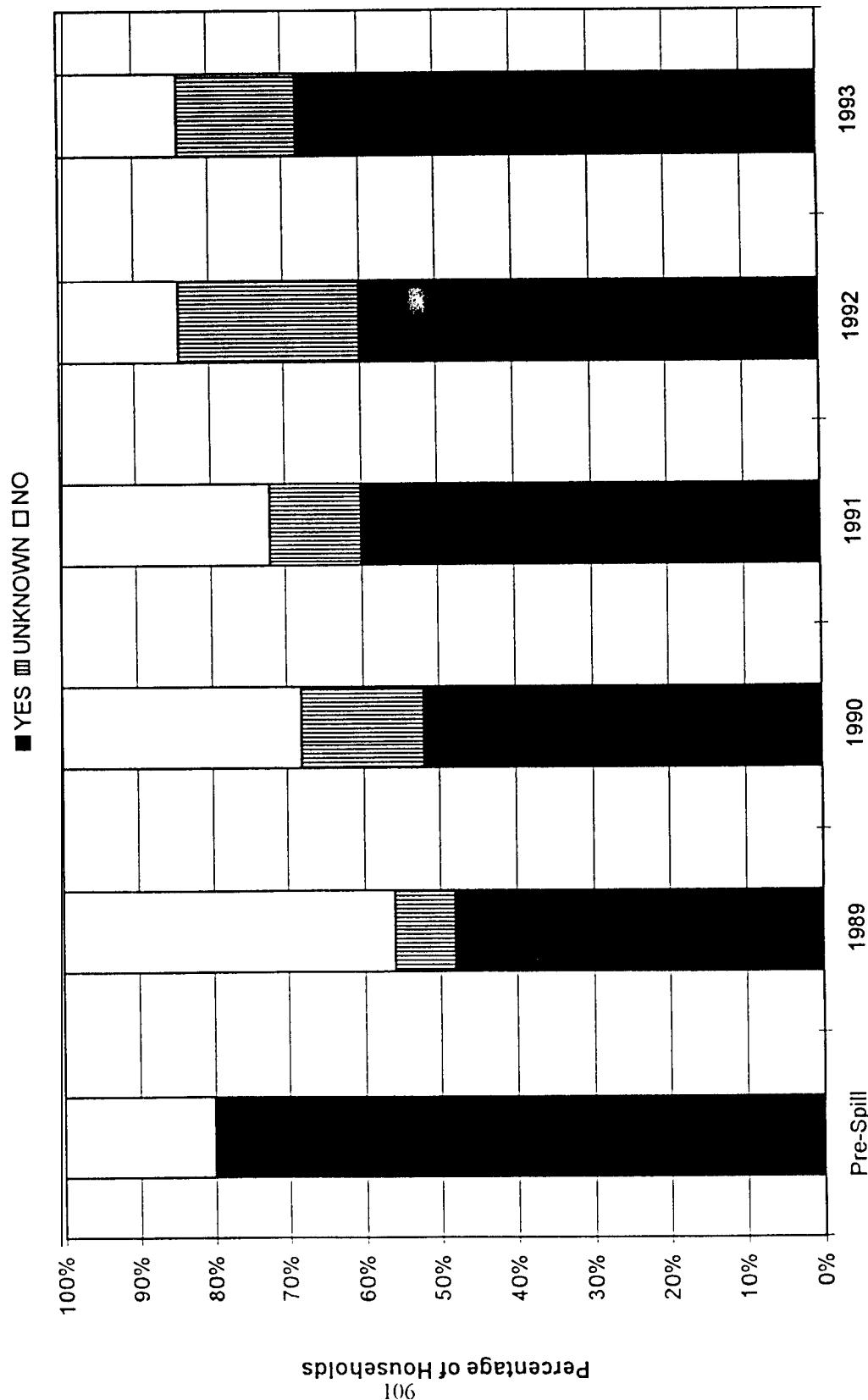
**Cumulative Usage of Bligh, Reef, and Busby Islands: Fish Other Than Salmon,
Tatitlek**



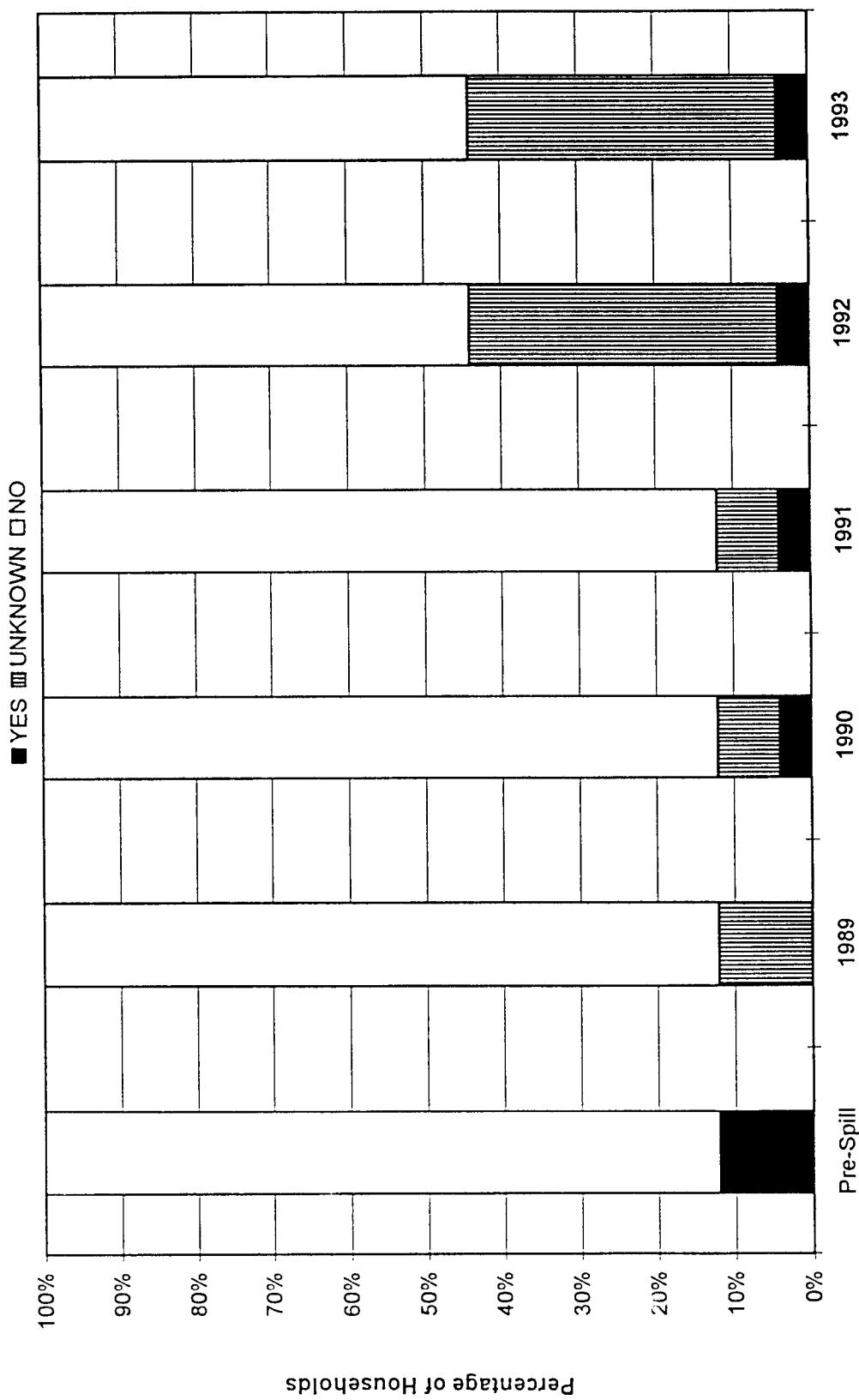
Cumulative Usage of Bligh, Reef, and Busby Islands: Marine Invertebrates,
Tatitlek



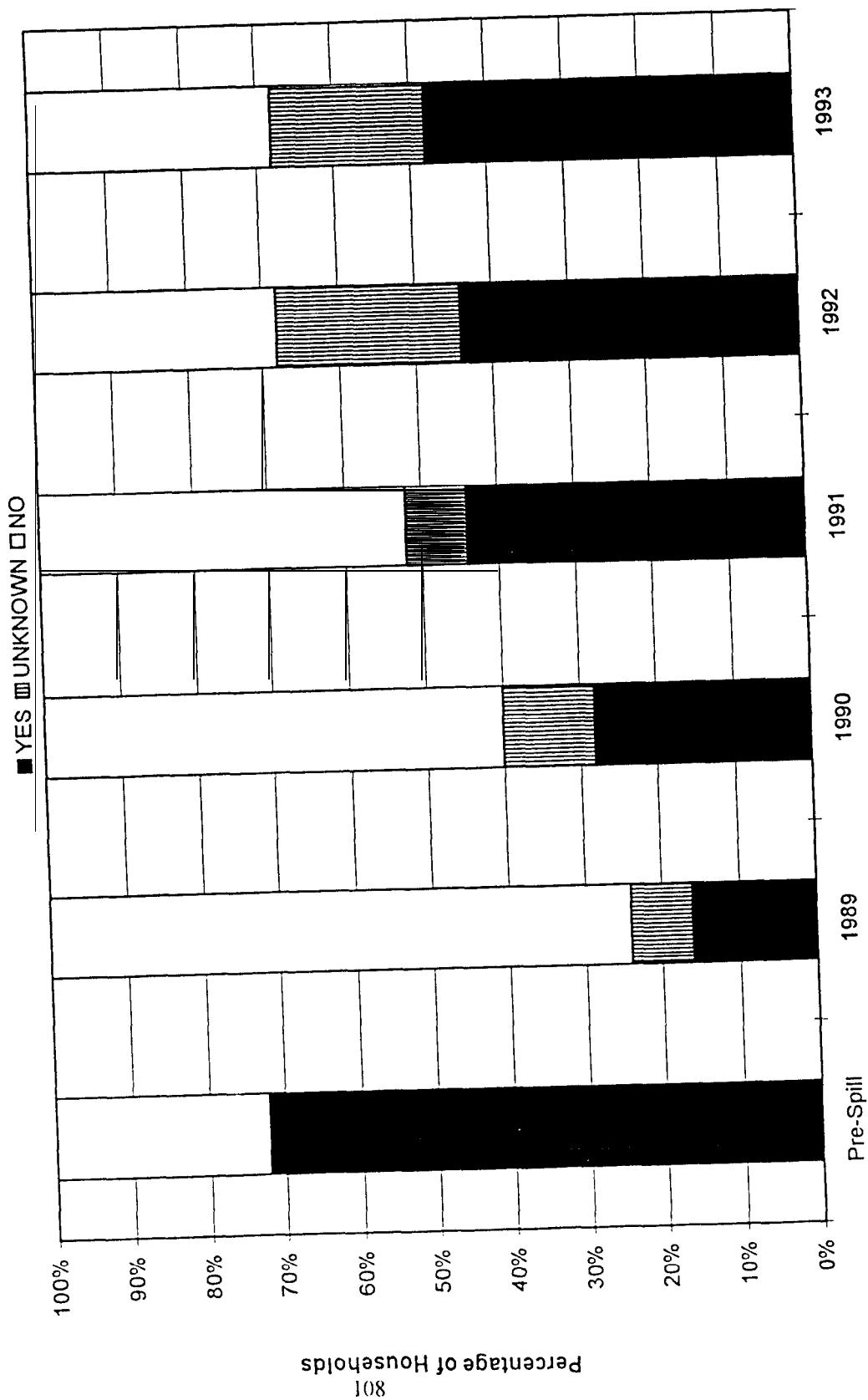
Cumulative Usage of Bligh, Reef, and Busby Islands: Large Land Mammals, Tatitlek



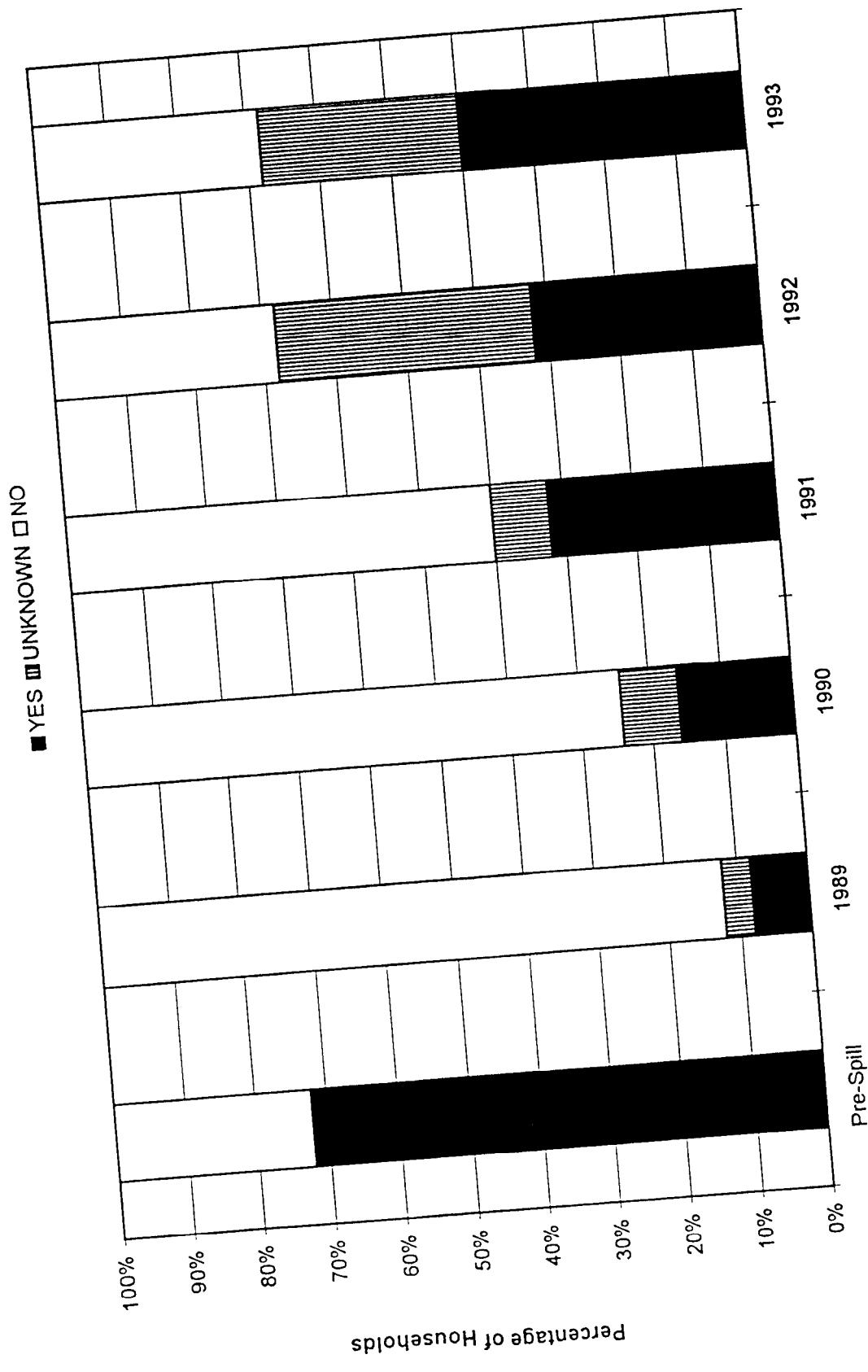
Cumulative Usage of Bligh, Reef, and Busby Islands: Small Mammals/Furbearers, Tatitlek



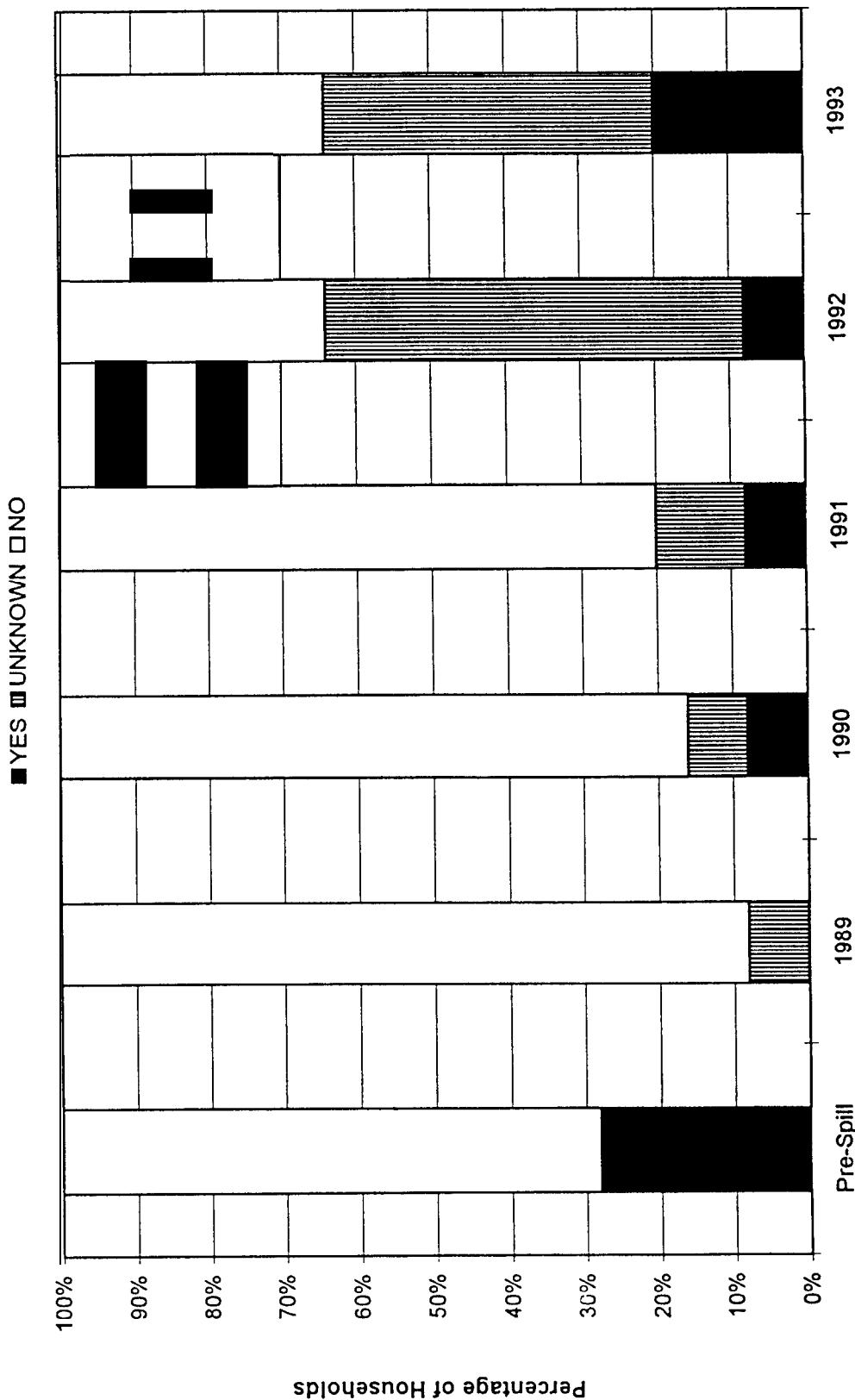
Cumulative Usage of Bligh, Reef, and Busby Islands: Marine Mammals,
Tattilek



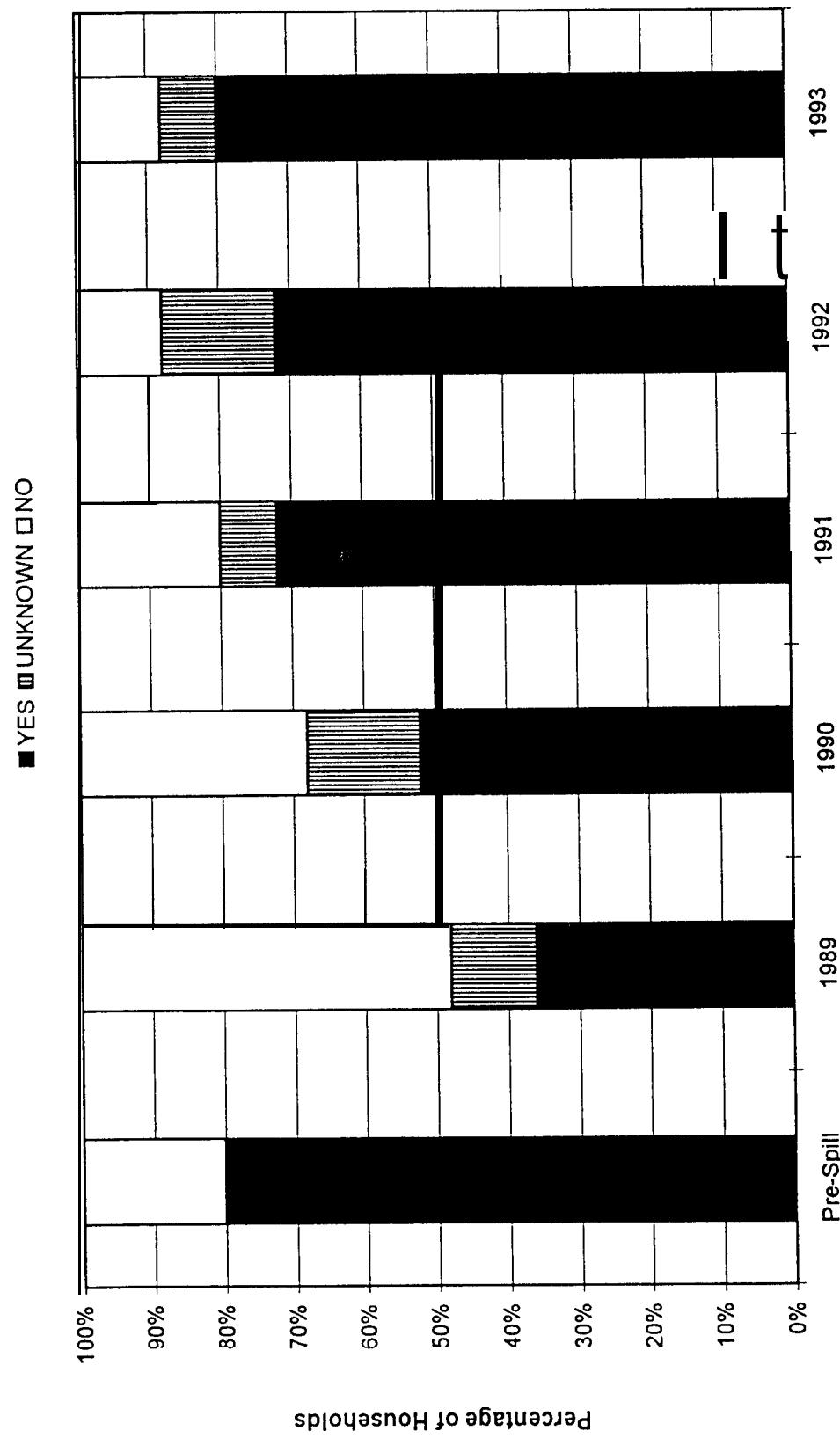
Cumulative Usage of Bligh, Reef, and Busby Islands: Birds, Tatitlek



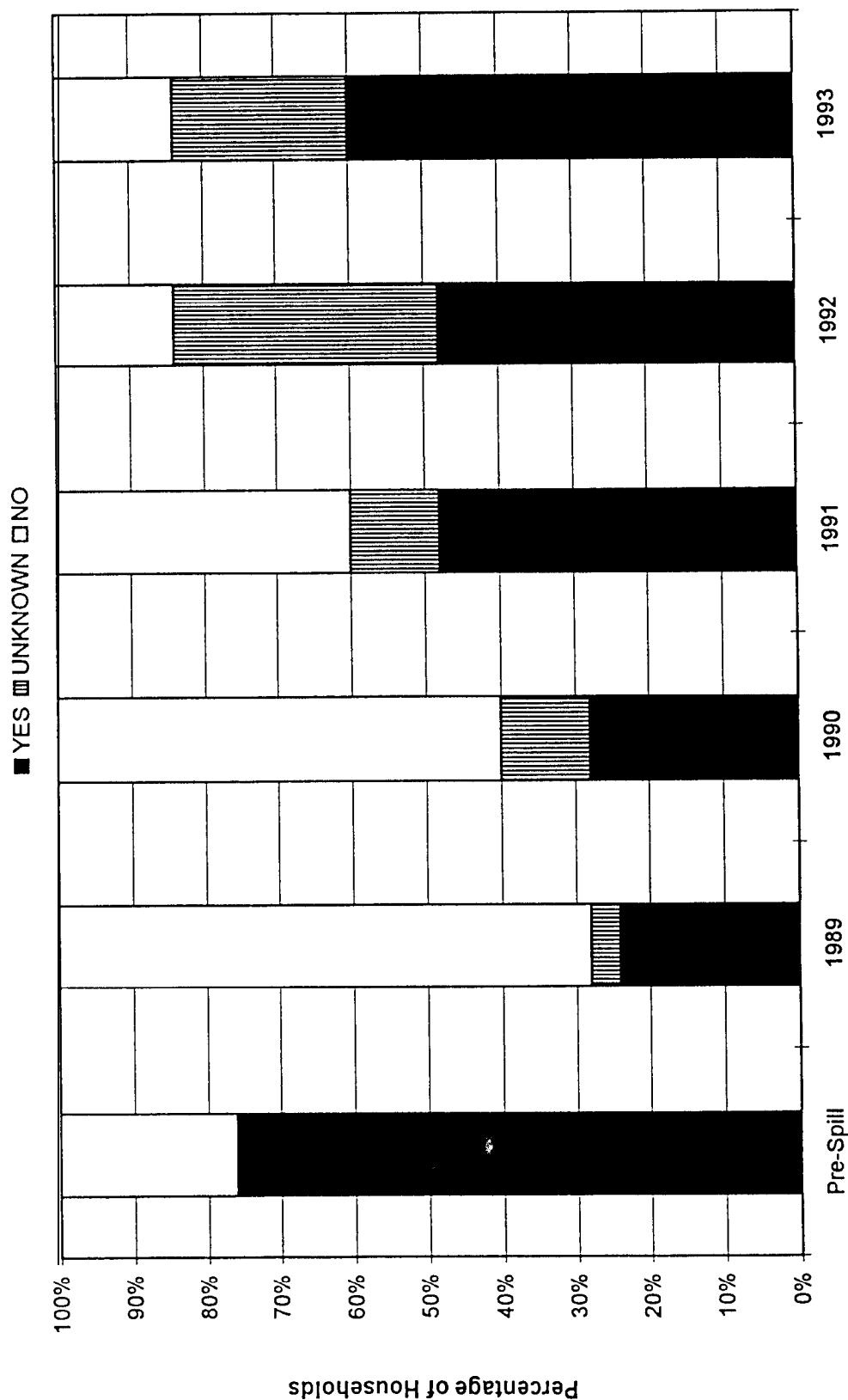
**Cumulative Usage of Bligh, Reef, and Busby Islands: Plants,
Tatitiek**



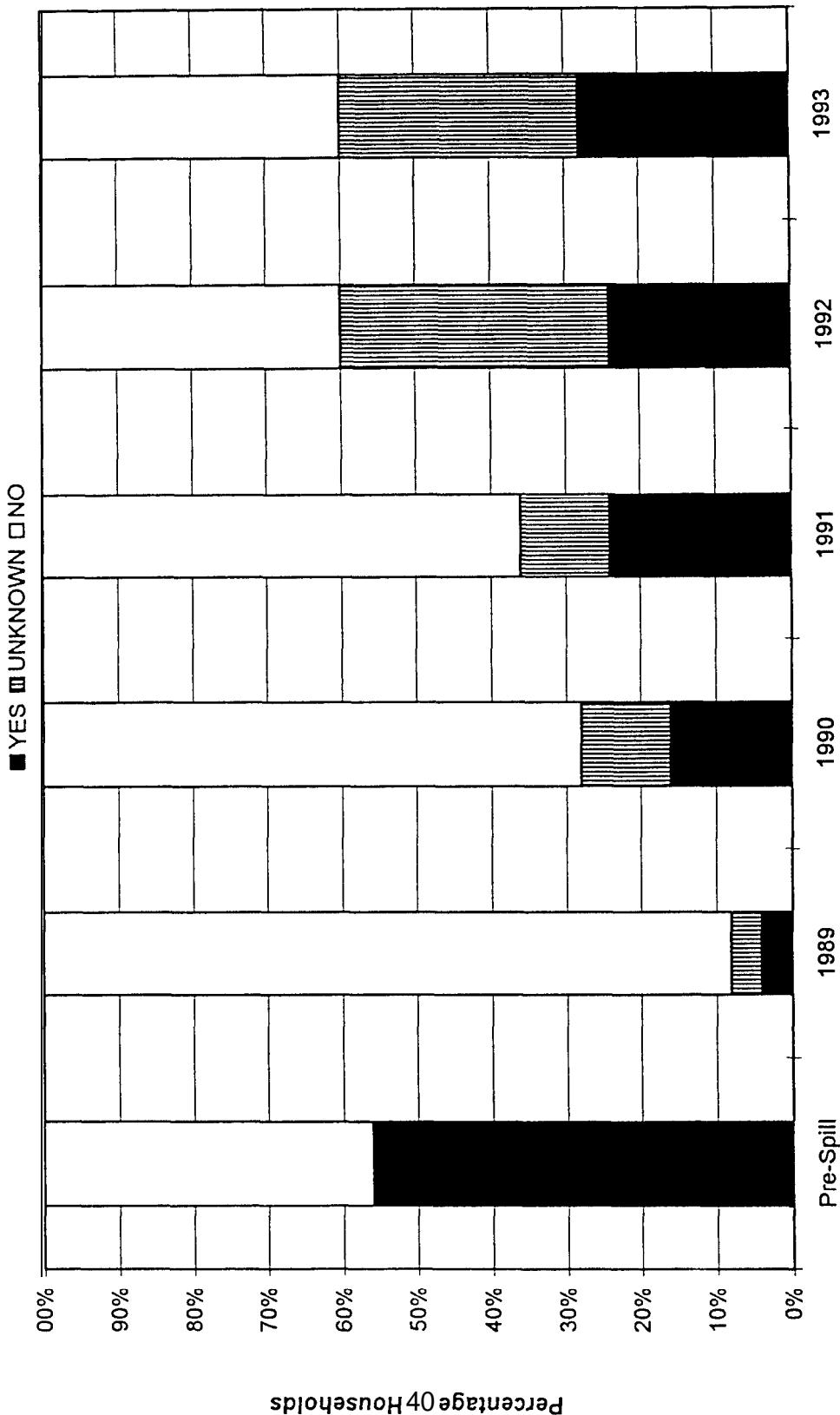
Cumulative Usage of Boulder Bay: Any Resource, Tatitlek



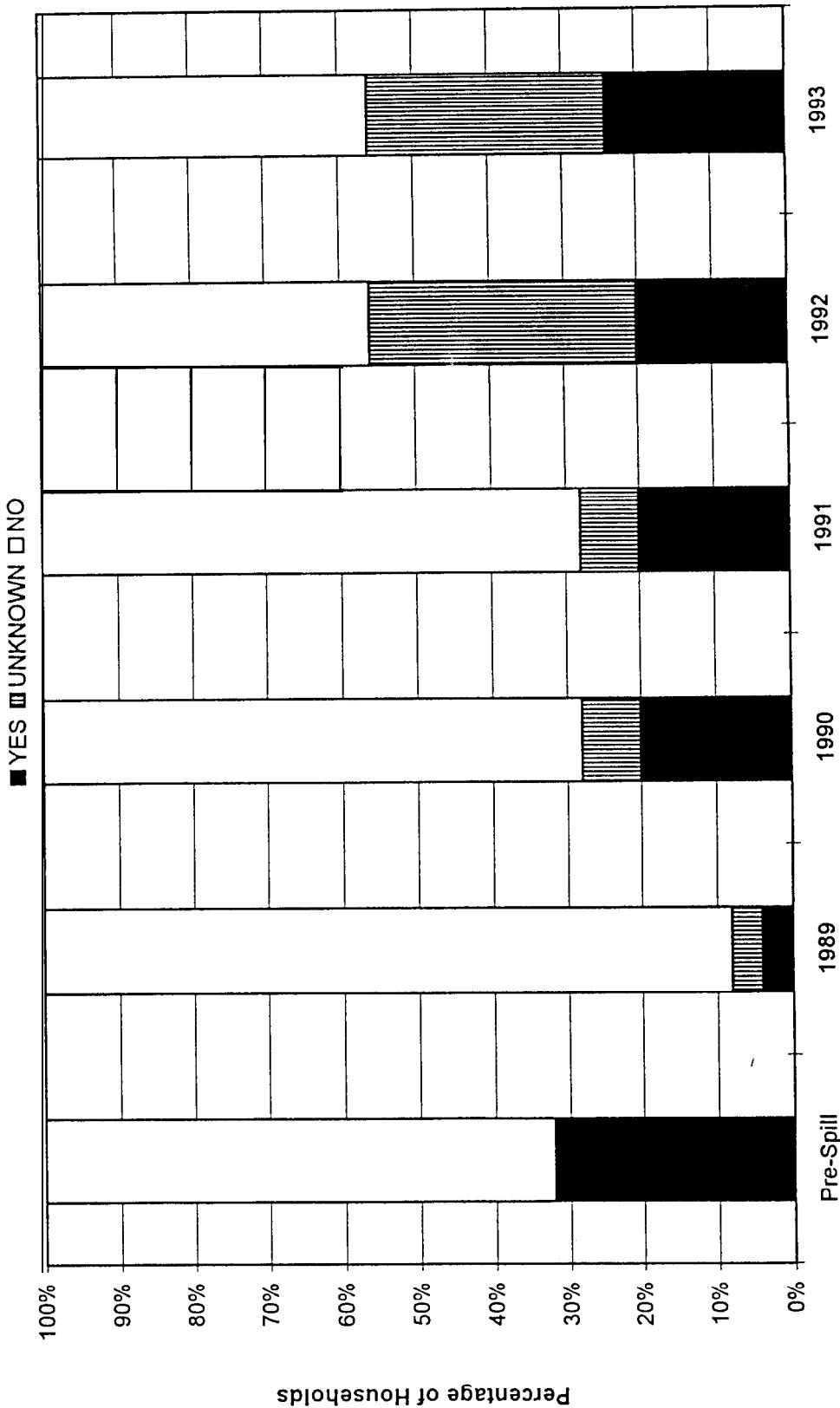
Cumulative Usage of Boulder Bay: Salmon,
Tatitlek



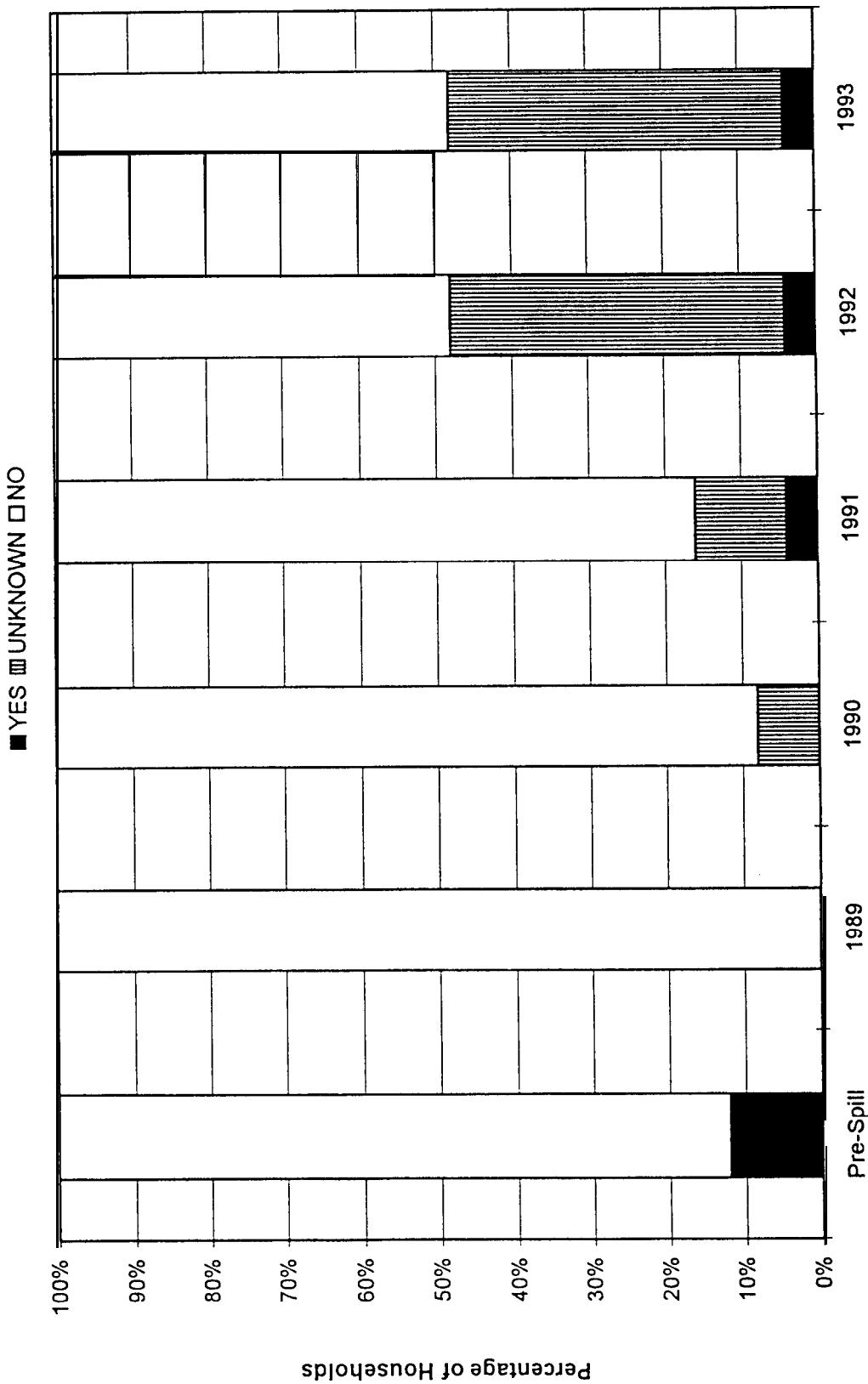
**Cumulative Usage of Boulder Bay: Fish Other Than Salmon,
Tatitlek**



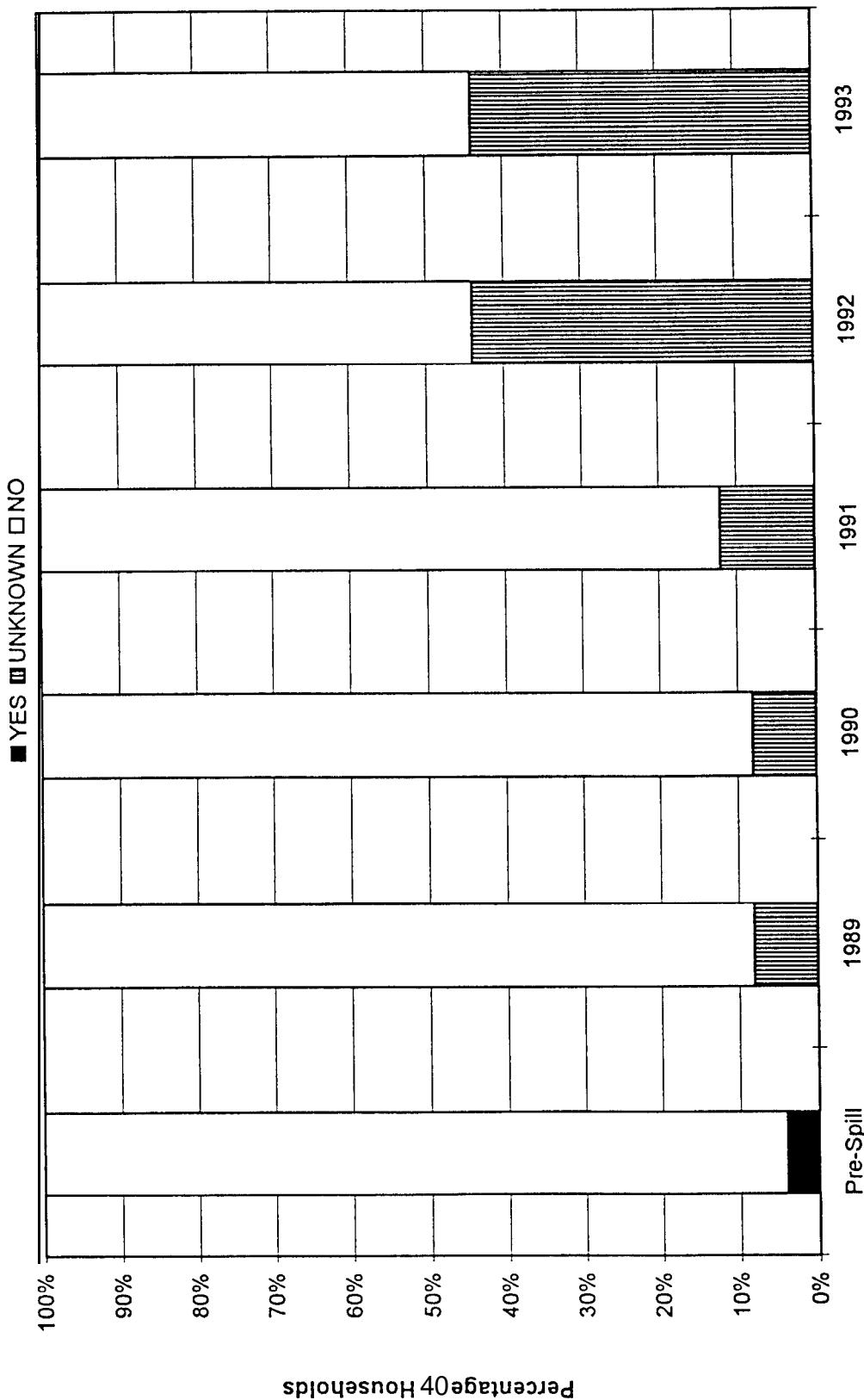
**Cumulative Usage of Boulder Bay: Marine Invertebrates,
Tatitlek**



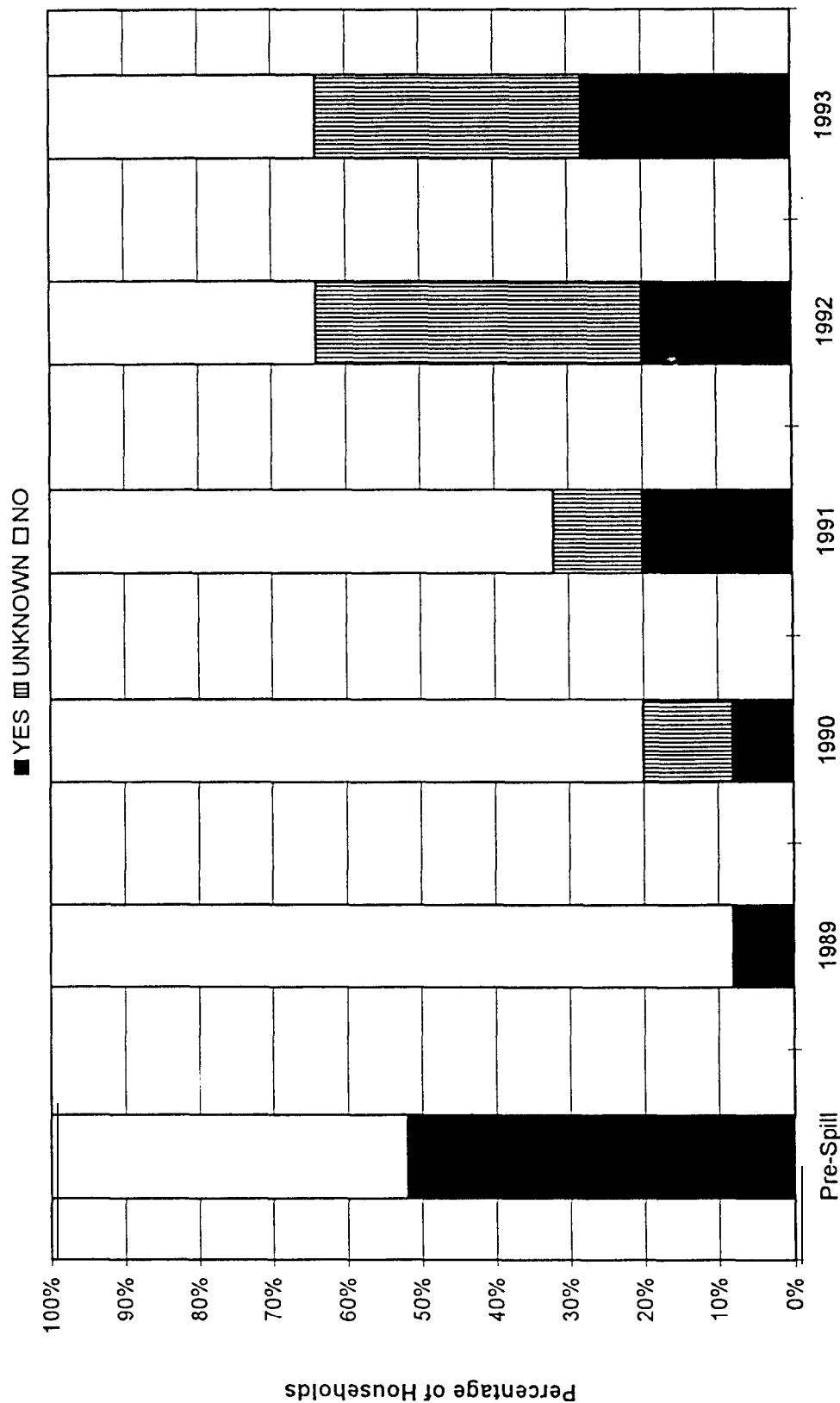
Cumulative Usage of Boulder Bay: Large Land Mammals, Tatitlek



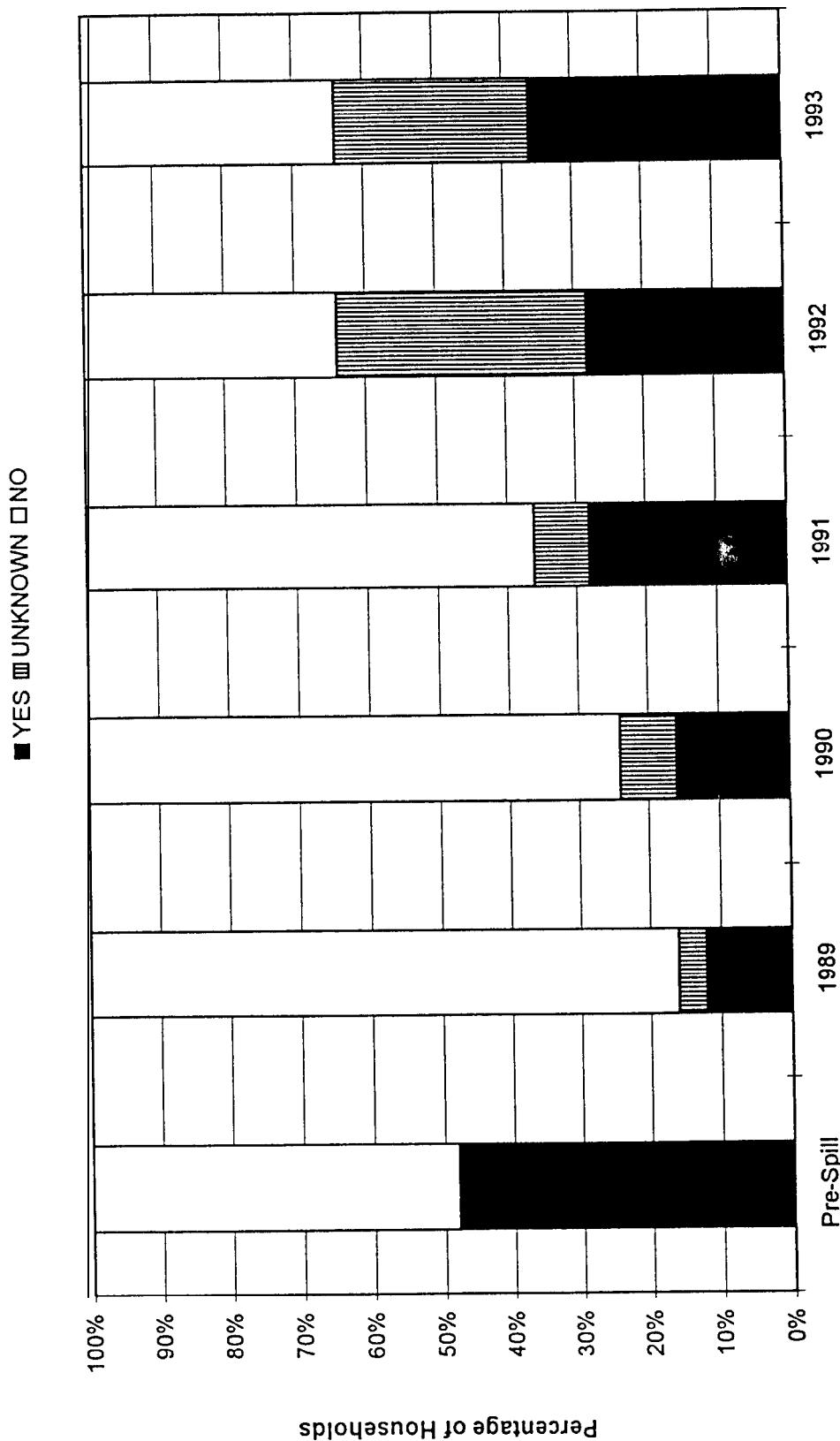
Cumulative Usage of Boulder Bay: Small Mammals/Furbearers, Tattilek



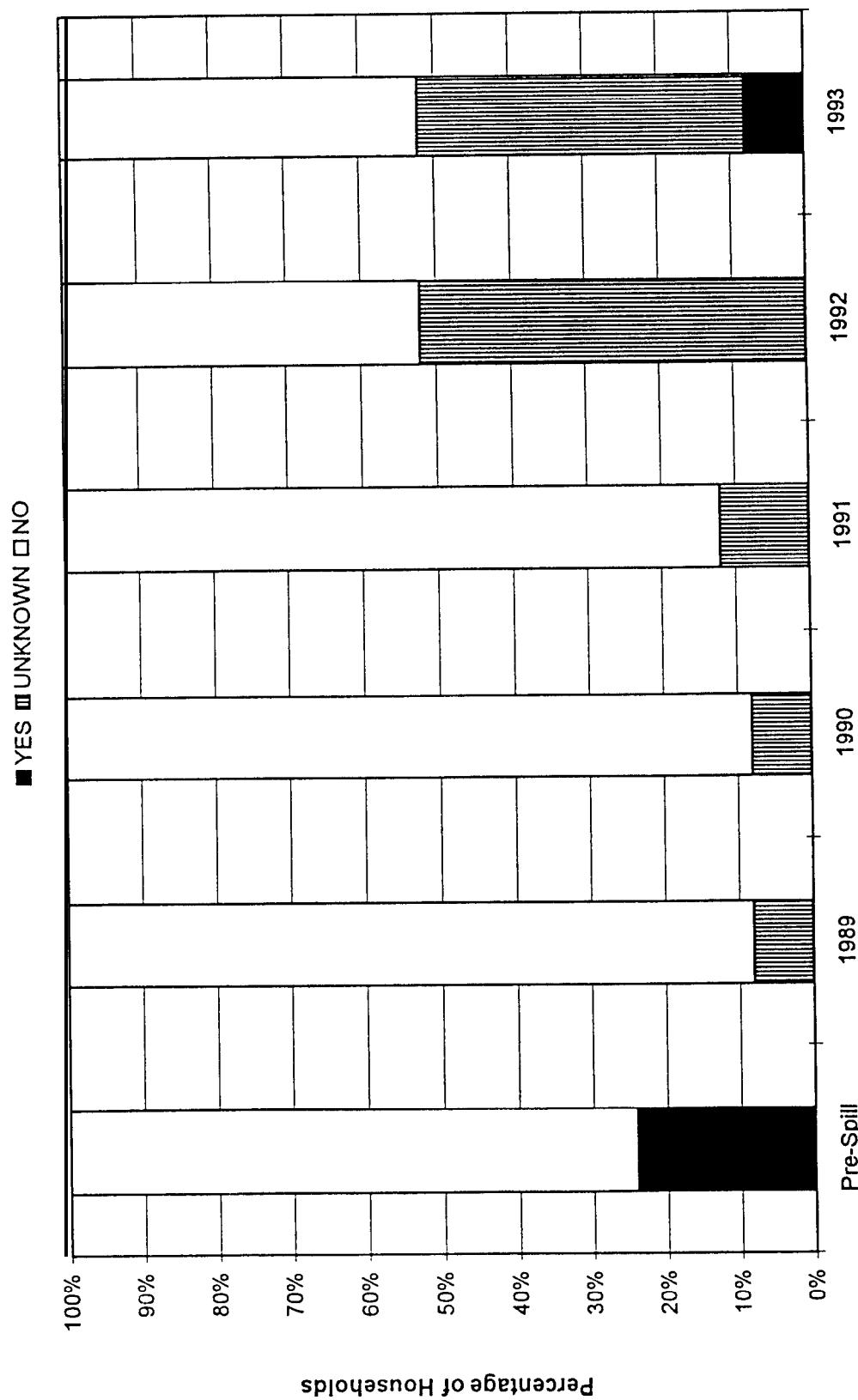
**Cumulative Usage of Boulder Bay: Marine Mammals,
Tatitlek**



Cumulative Usage of Boulder Bay: Birds, Tatitlek

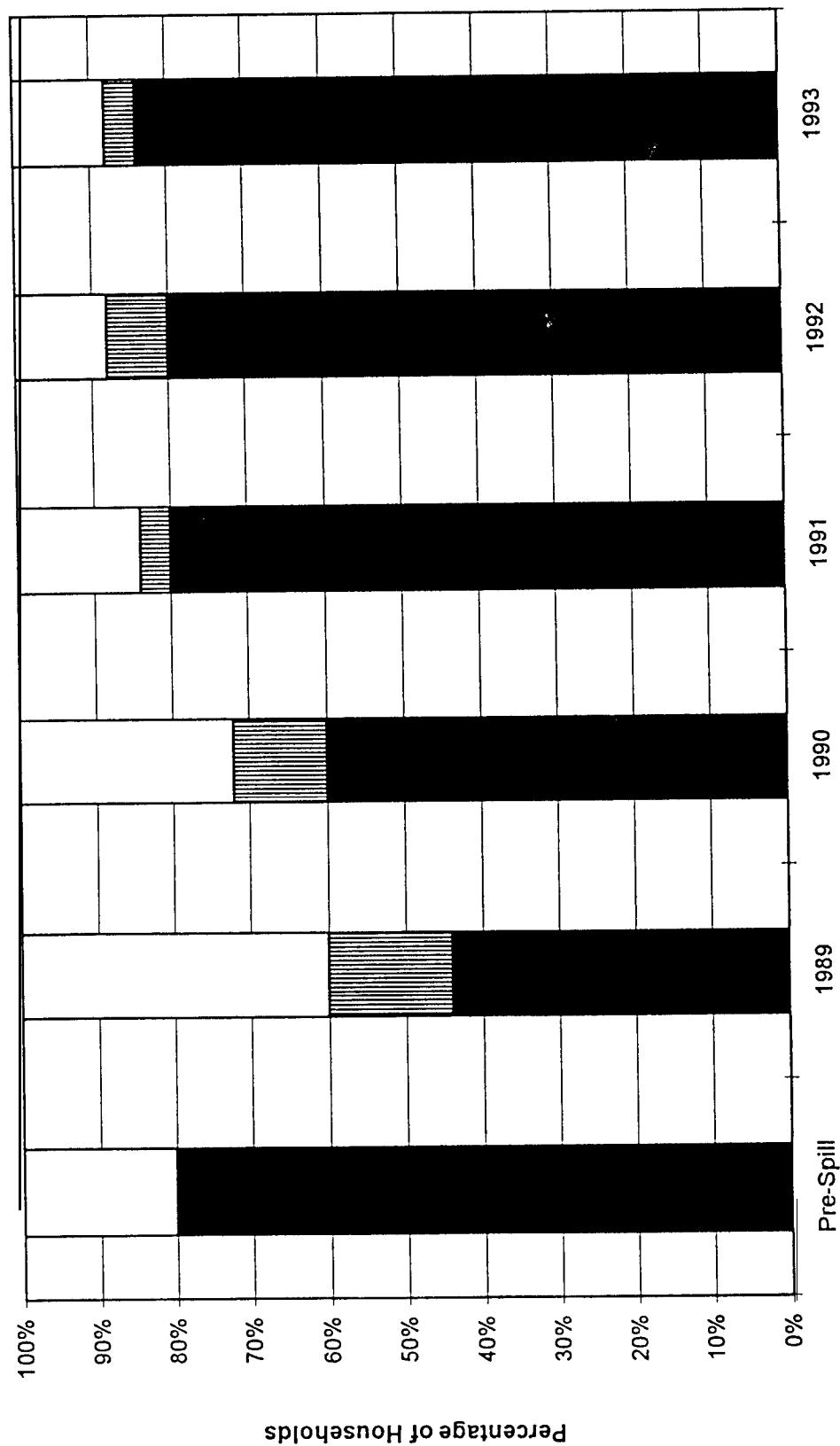


Cumulative Usage of Boulder Bay: Plants,
Tatitlek

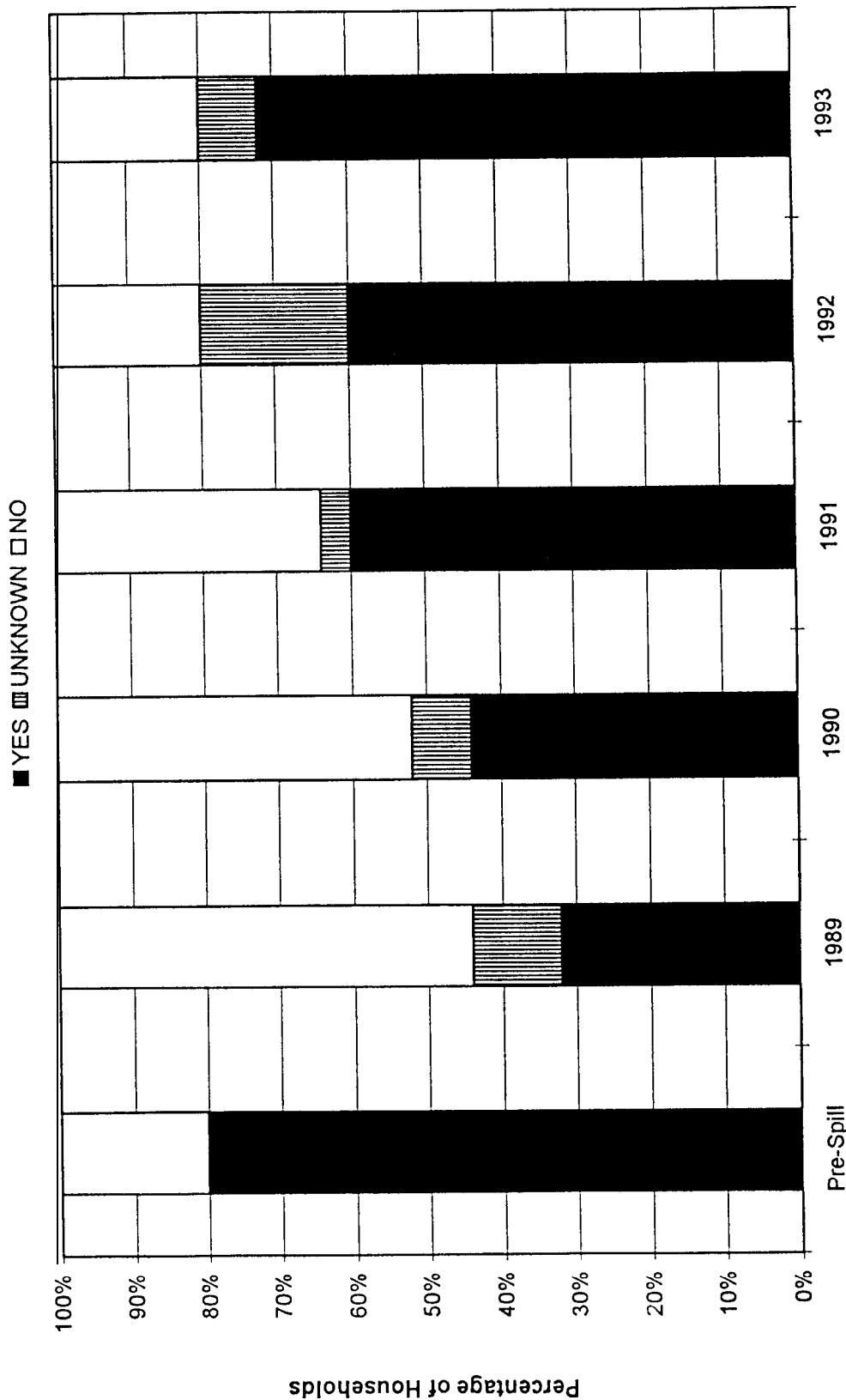


Cumulative Usage of Tatitlek Narrows: Any Resource, Tatitlek

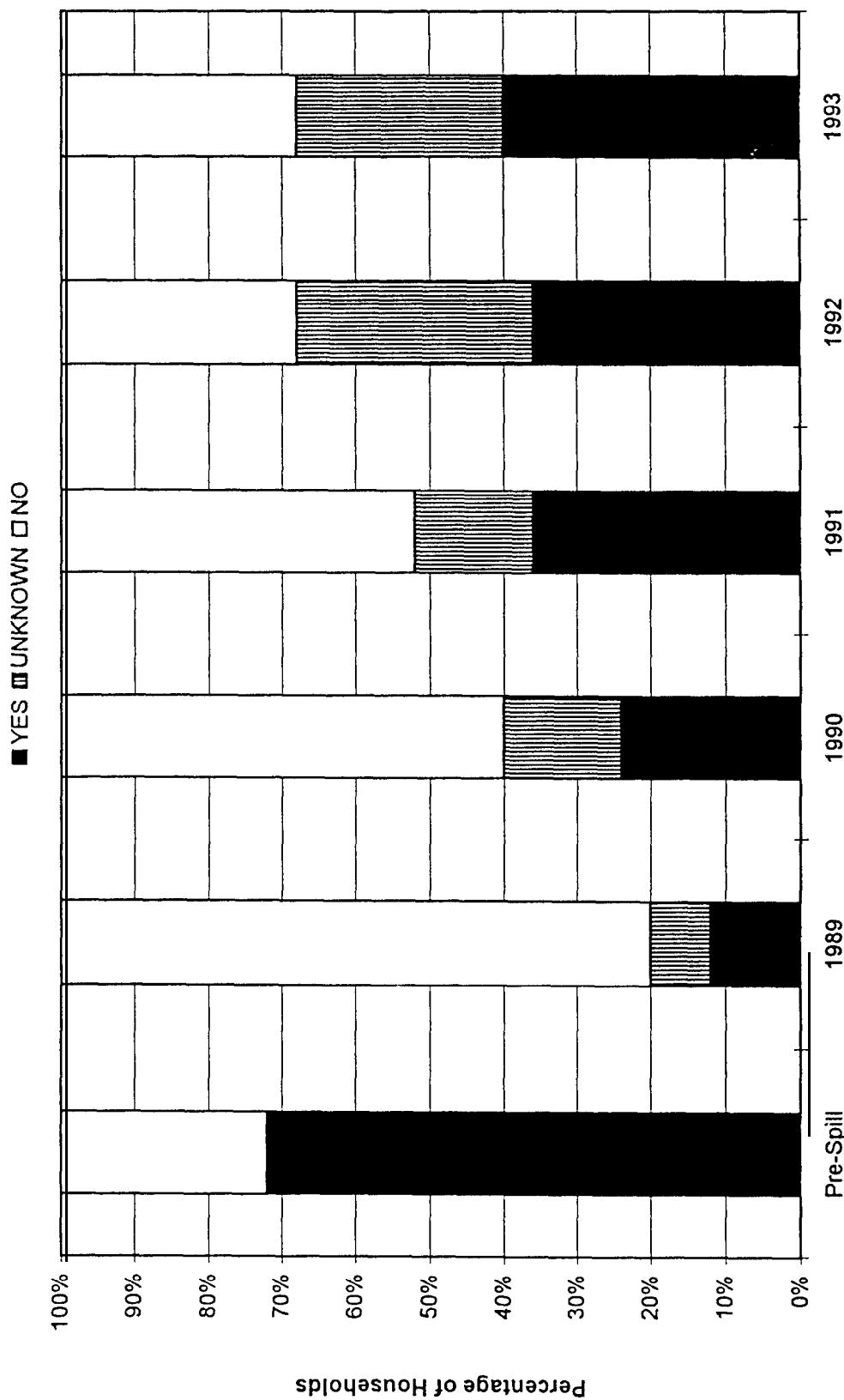
■ YES ▨ UNKNOWN □ NO



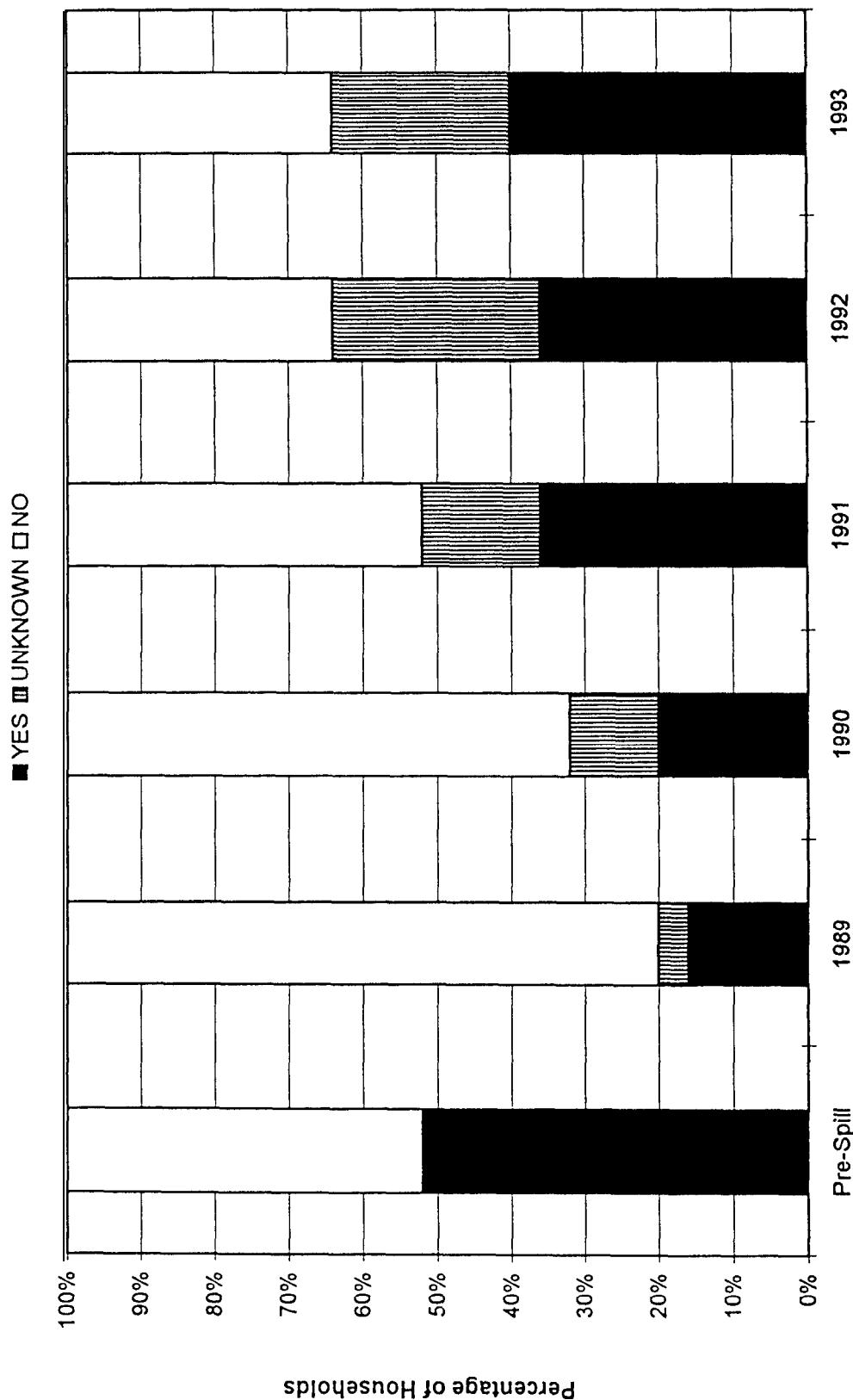
**Cumulative Usage of Tatitlek Narrows: Salmon
Tatitlek**



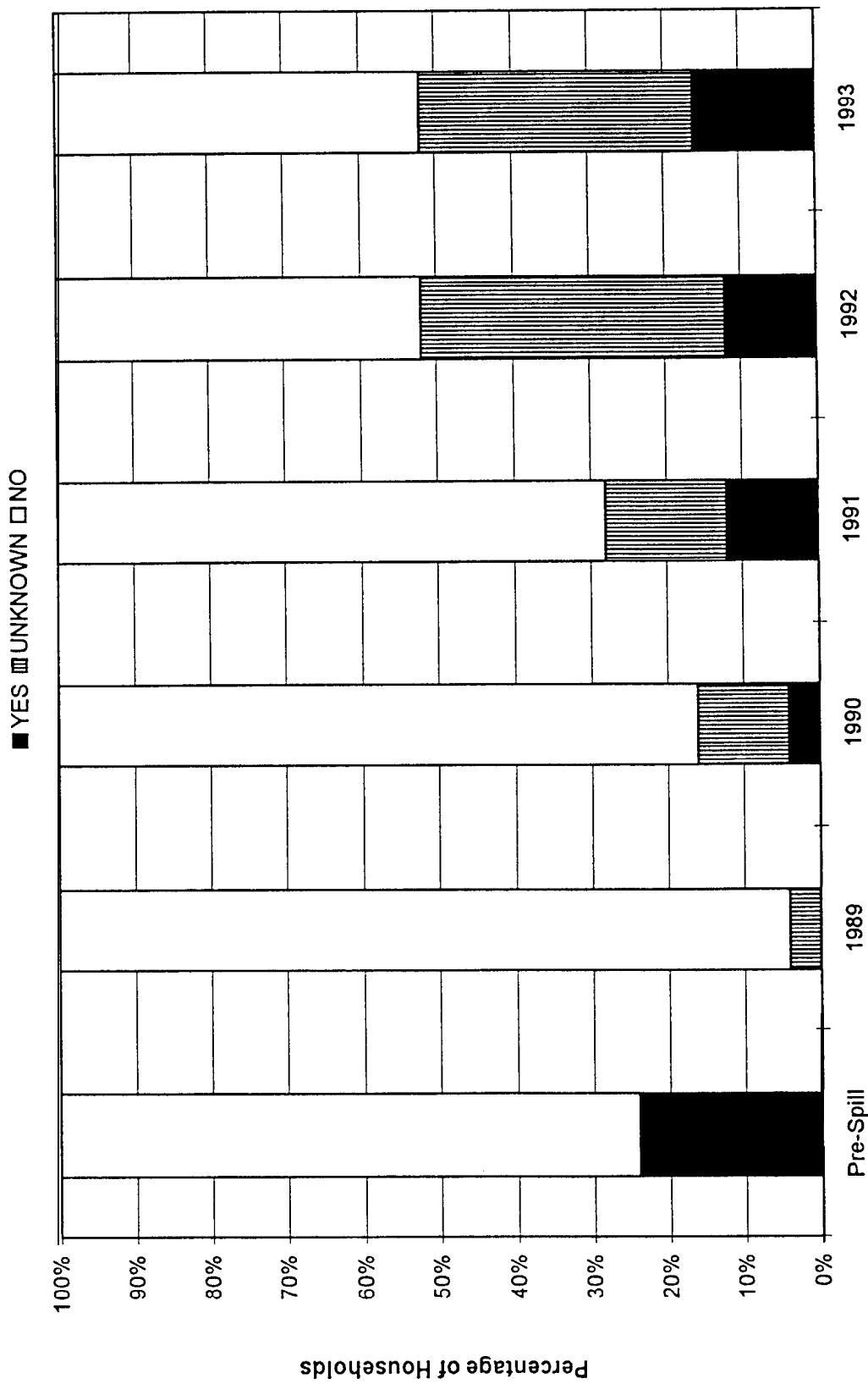
**Cumulative Usage of Tatitlek Narrows: Fish Other Than Salmon,
Tatitlek**



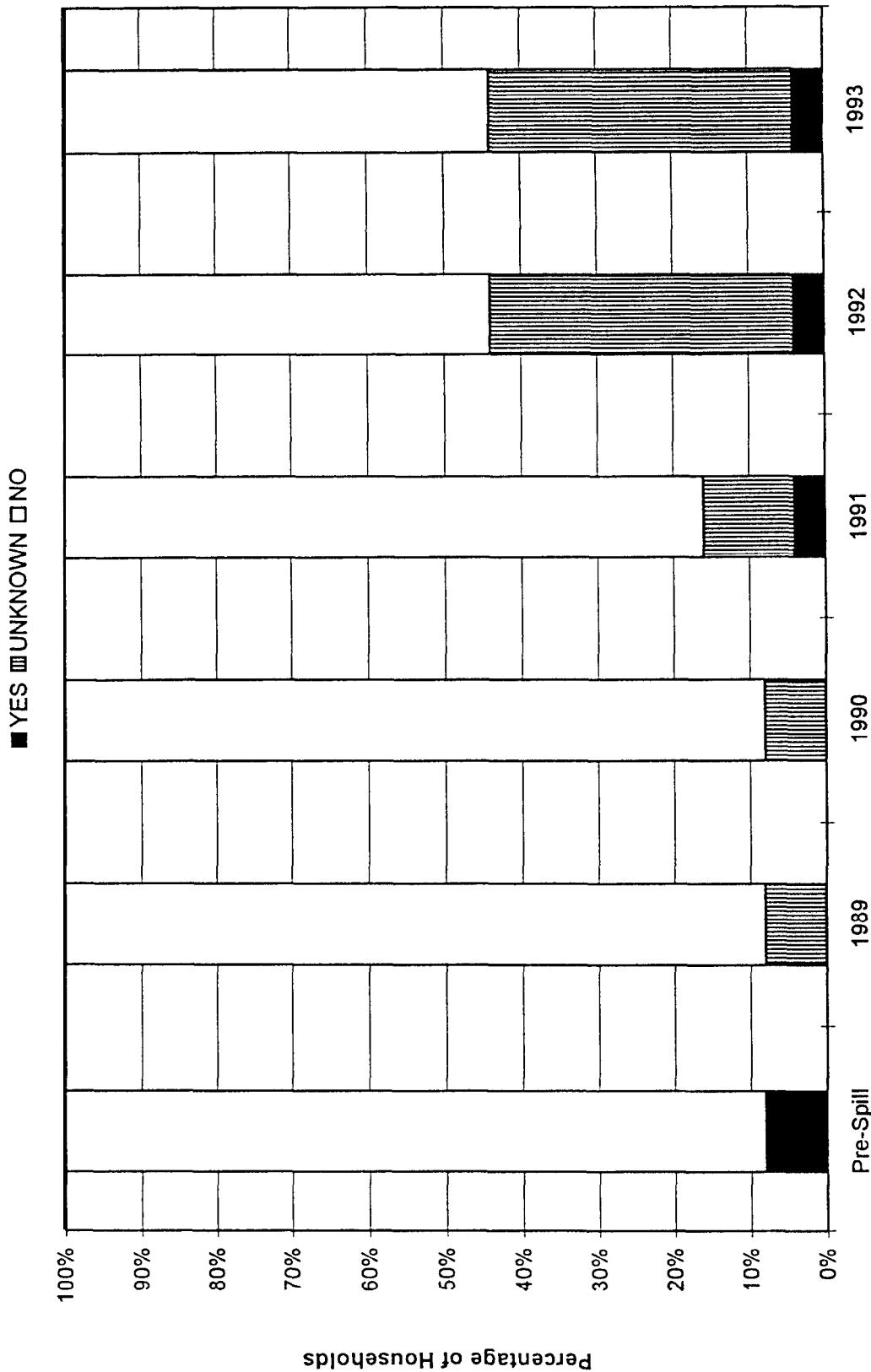
Cumulative Usage of Tatitlek Narrows: Marine Invertebrates,
Tatitlek



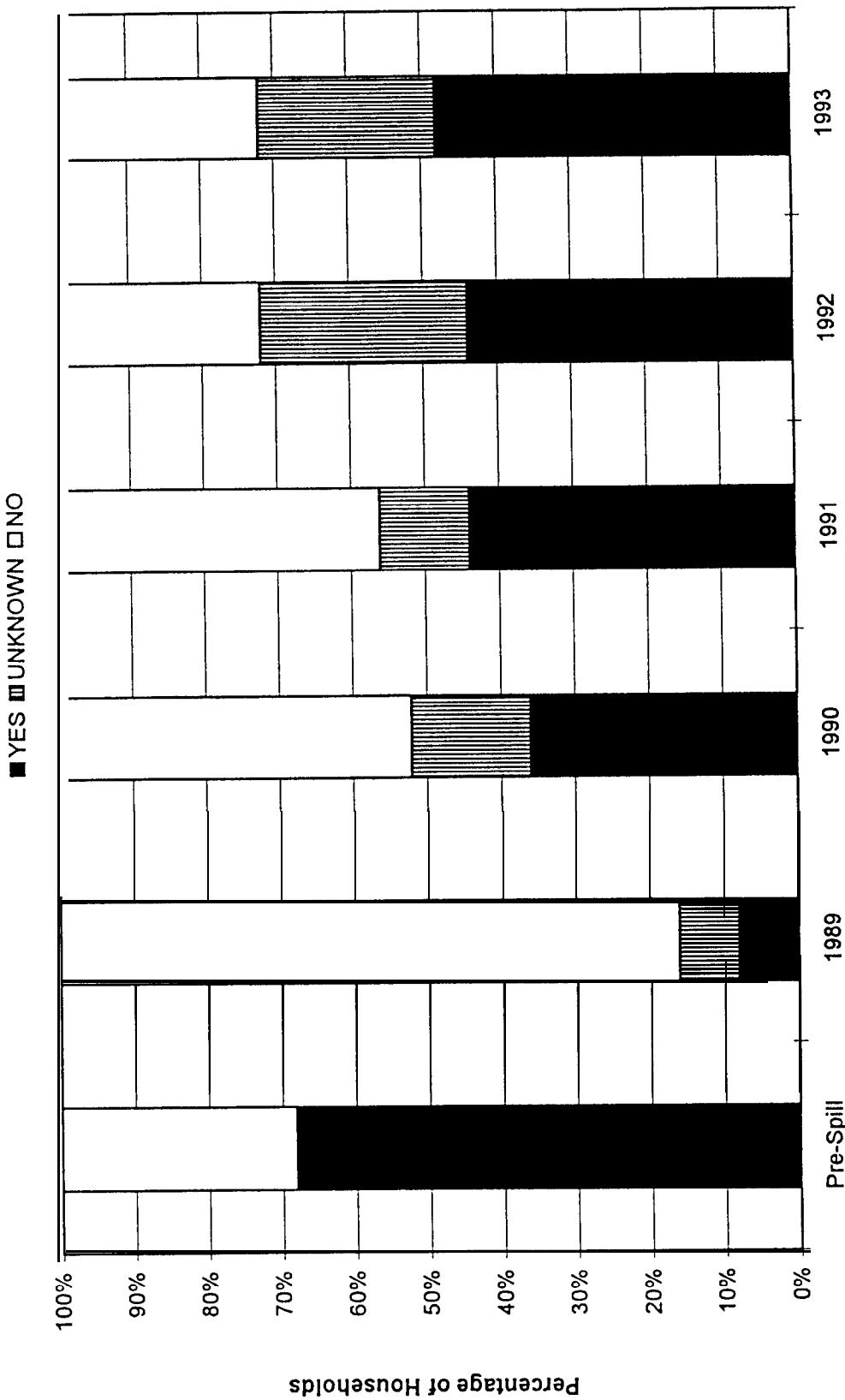
Cumulative Usage of Tatitlek Narrows: Large Land Mammals, Tatitlek



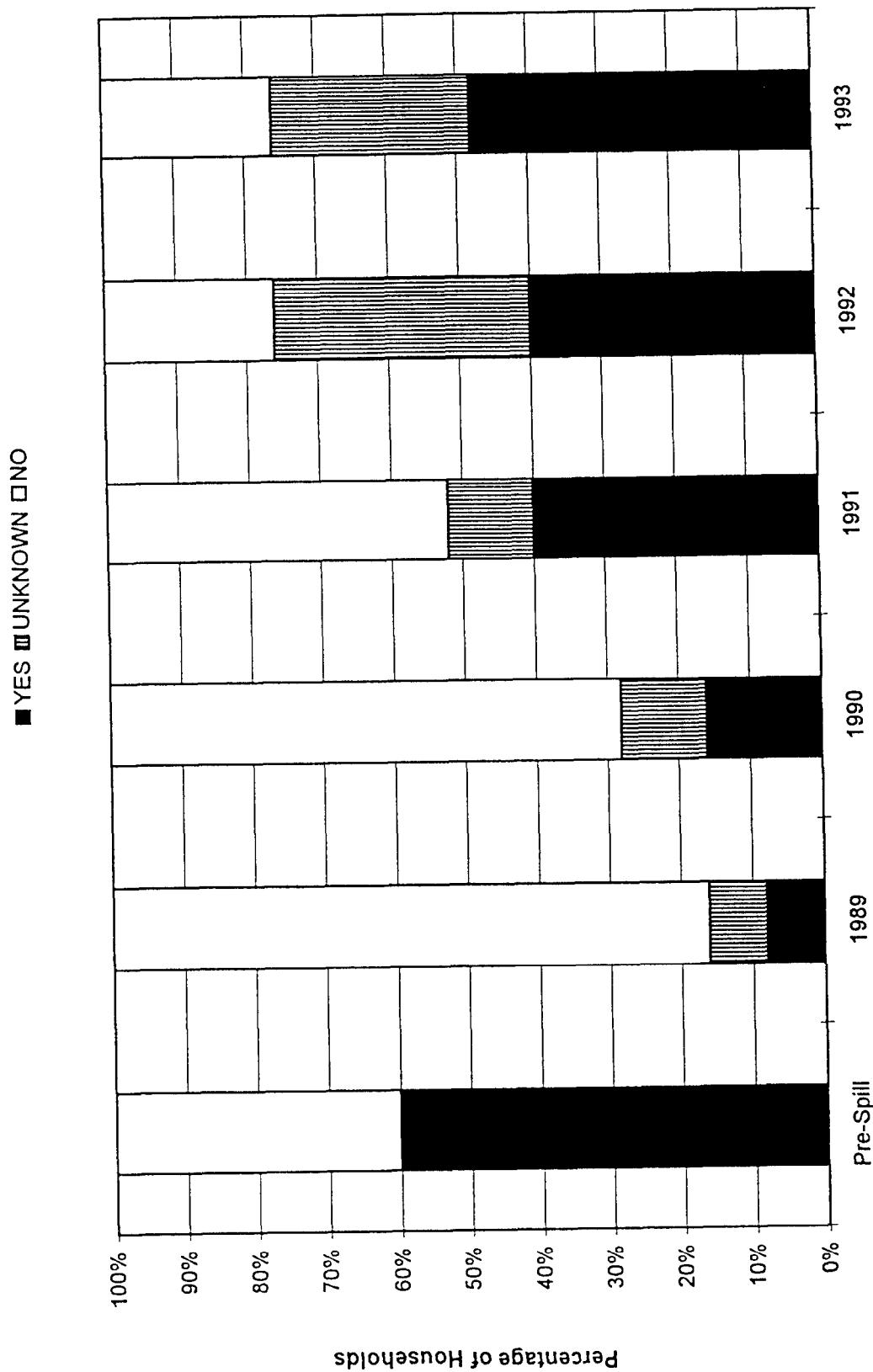
Cumulative Usage of Tatitlek Narrows: Small Mammals/Furbearers, Tatitlek



**Cumulative Usage of Tatitlek Narrows: Marine Mammals,
Tatitlek**



Cumulative Usage of Tatitlek Narrows: Birds, Tatitlek



Cumulative Usage of Tattlek Narrows: Plants,
Tattlek

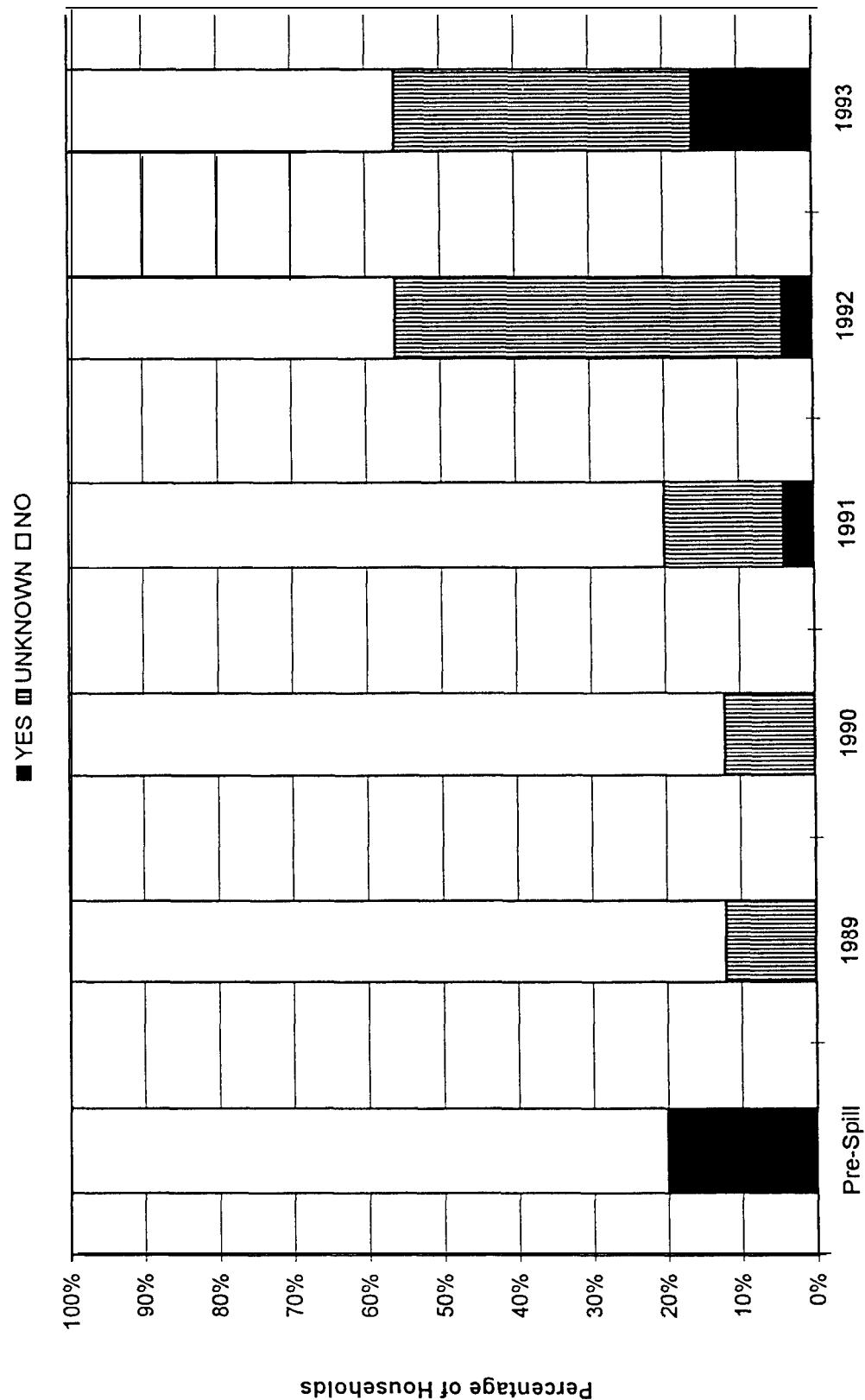


Figure 65. Changes in Use of Selected Areas for Marine Invertebrate Gathering, Ouzkinie, 1989 and 1990

